The Builder.

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MR. FERGUSSON'S "Illustrated Handbook of Architecture"* having been already commended, as we have reported, from the Chair of the Royal Academy, favoured with a column and a half of praise in the *Times*, and flatteringly mentioned by leading literary journals, is in need of little more to make it known to the public, and ensure for the ability and labours of the author, and the enterprise of the publisher, the reward justly their due. A reactionary and not uncommon feeling might indeed suggest that all we had now to do was to point out its weaknesses, combat its theories, and speak rather of what the author had omitted to do than of what he had done. What would be easier, and what more agreeable to the majority of readers? Nothing. Nevertheless, we have no intention of taking this course. We have already given the Handbook a general expression of praise, and are fully prepared to confirm that expression in detail.

Objections we have, some of them strong ones, and to these we shall allude; but it must not therefore be inferred, even though they should occupy the greater part of our notice, that we do not warmly admire and thankfully receive the very valuable book which Mr. Fergusson has produced. First, let us tell our country readers, who are often unable to see previously the book they would buy, that the two volumes contain together 991 pages of letter-press with 837 engravings on wood interspersed. The first part (and volume) consists of nine books:—Buddhist and Jaina Architecture; Hindu Architecture; Architecture in China and America; Architecture in Western Asia; Egyptian Architecture; Grecian Architecture; Roman Architecture; Sassanian Architecture; and Saracenic Architecture; the whole preceded by an introduction, thirty-three pages in length. In the second part (and volume) we have ten books:—Romanesque style; Lombard and Rhenish Architecture; Gothic Architecture in France; in Germany; in Belgium; in Italy; in Spain and Portugal; in Great Britain; in Northern Europe; and the Byzantine style. Some of the pith of other books by the author, "The Principles of Beauty in Art," and "The Palaces of Nineveh and Persepolis Restored," is here incorporated, together with cuts from the same works. And we may say of the latter generally, namely, the cuts, that all available sources have been laid under contribution to supply them, and that thus brought together, they afford most excellent means for comparison. The plans are drawn to one scale (100 feet to 1 inch), and thus enable the reader to judge of the relative size of two buildings, without seeing them. As a general rule, the sections or elevations of buildings, throughout the book, are drawn to a scale double that of the plans, or 50 feet to 1 inch; but, owing to the great size of many of these, it was found impossible to carry out this in all instances; where it has not been effected, the departure from the rule is noted, either below the woodcut or in the text.

The author's travels and previous researches have led him to give an undue preponderance to his accounts of some styles as compared with those of others: for example, the two books devoted to Buddhist and Hindu architecture occupy 132 pages, while Grecian architecture, to which the ruins that remain, confined though they are to temples and monumental erections, assign "the rank of the purest and most intellectual of all the styles which have yet been invented in any part of the world," occupies but thirty. In this chapter on Greek art, speaking of the Doric, he thus expresses his opinion on the subject of *polychromy*:—

"Another essential part of the order, too often overlooked, is the colour, which was as integral a part of it as its form. Till very lately, it was denied that Greek temples were, or could be, painted: the unmistakeable remains of it, however, that have been discovered in almost all temples, and the greater knowledge of the value and use of colour which now prevails, have altered the public opinion very much on the matter, and most people admit that some colour was used, though few are agreed as to the extent to which it was carried.

It cannot now be questioned that colour was used everywhere internally, and on every object. Externally, too, it is generally admitted that the sculpture was painted and relieved by strongly coloured backgrounds: the lacunaria, or recesses of the roof, were also certainly painted, and all the architectural mouldings, which at a later period were carved in relief, have been found to retain traces of their painted ornaments.

It is disputed whether the echinus or curved moulding of the capital was so ornamented. I think it undoubtedly was; and the walls of the cells were also coloured throughout, and covered with paintings illustrative of the legends and attributes of the divinity to whom the temple was dedicated, or of the purposes for which it was erected. The plane face of the architrave, I believe, was left white, or merely ornamented with metal shields or inscriptions, and the shafts of the columns seem also to have been left plain, or merely slightly stained to tone down the crudeness of the white marble. Generally speaking, all those parts which from their form or position were in any degree protected from the rain or atmospheric influences seem to have been coloured; those particularly exposed, to have been left plain. To whatever extent, however, it may have been carried, these coloured ornaments were as essentially a part of the Doric order as the carved ornaments were of the Corinthian, and made it, when perfect, a richer and more ornamental, as it was a more solid and stable, order than the latter. The colour nowhere interfered with the beauty of its forms, but gave it that richness and amount of ornamentation which is indispensable in all except the most colossal buildings, and a most valuable adjunct even to them."

The arrangement of the chapters on the different styles does not seem to us that best adapted to leave a clear notion of the relative dates in the mind of the student; and there is, as it seems to us, a want of accentuation, so to speak, throughout the book, by means of which the chief resting-places and starting-points in the journey might have been made clearer to those desiring to remember them. The arrangement made was not adopted without consideration, as the author points out in the preface. He deliberated between the strictly chronological and the purely topographical, and ultimately adopted a combination of the two methods; but when we find this places Indian and Chinese architecture at the commencement of the work, before the Egyptian and Assyrian; and the account of Byzantine architecture after all others, at the end of the second volume,—the propriety of the decision is made to appear doubtful. For another edition it should be reconsidered. We would also suggest, though in no captious spirit, that a clear statement of the characteristics of the various styles, and their differences, would render the work more valuable; nor must we omit to say, that the omission of all account of the architects of the Revival, and their works, in a book professing to describe "the different styles of architecture prevailing, in all ages and countries," is scarcely defensible. The style is not ignored, because in the Introduction, Mr. Fergusson says, it has been practised for more than three centuries, and that "from the building of St. Peter's, at Rome, to that of our own Parliament Houses (?), not one building has been produced that is admitted to be entirely satisfactory, or which permanently retains a hold on general admiration;" but beyond this we do not find any mention whatever made either of the men or of their works.

In our notice of Mr. Petit's lecture last week, we said that the object he had in view was to inculcate the necessity for the acquirement of knowledge by architects of the materials obtainable, that they should attend to the purposes of the building they had to design, and strive above all things to act on sound principles of construction as the means of arriving at excellence; and we remarked that it was urged "almost as if in denial of a doctrine put prominently forward by Mr. Fergusson in his ably-written and profusely-illustrated Handbook." "Architects," said Mr. Petit, "must be guided by utilitarian views: they have no right to overlook or compromise in the smallest degree, the original purposes of the buildings they have undertaken, for the sake of ornament, be it of the highest order."

On this Mr. Fergusson has addressed to us the following communication:—

"I regret to perceive from the commencement of your leading article of last week, that I should have been so far misunderstood as to be represented as antagonistic in my views to those expressed by Mr. Petit in his lecture on Tuesday last. So far from this being really the case, I can honestly assert that it has never been my good fortune to listen to a lecture on an architectural subject, with every sentiment of which I so cordially agree, as I did with those expressed in the lecture in question. There was not one expression used by Mr. Petit from which I differed, or one opinion uttered by him that I could have hesitated in adopting in the Essay referred to.

I take the liberty of addressing this letter to you, as I am anxious that the idea of our disagreeing should not go abroad uncontradicted, inasmuch as it is a source of great gratification to me to find a gentleman of Mr. Petit's position and abilities arriving at the same conclusion as I have done, though hitherto an entire stranger to me personally, because the fact of two independent inquirers agreeing in everything as we do in all essential parts of our subject, may give to others confidence in the conclusions we have arrived at. JAS. FERGUSSON."

The observations to which we alluded are these, and occur in the Introduction.

"The art of the civil or military engineer [says our author] consists in selecting the best and most appropriate materials for the object he has in view, and using these in the most scientific manner, so as to ensure an economical but satisfactory result. Where the engineer leaves off, the art of the architect begins. His object is to arrange the materials of the engineer, not so much with regard to economical as to artistic effects, and by light and shade, and outline, to produce a form that in itself shall be permanently beautiful."

And afterwards, although it is said that it is indispensably necessary that the architect should understand construction, Mr. Fergusson thinks it would be well if "he could delegate the mechanical part of his task to the engineer, and so restrict himself entirely to the artistic arrangement and the ornamentation of his design." Again, "This division of labour is essential to success," he says, and "a building may be said to be architectural in the proportion in which the artistic or ornamental purposes are allowed to prevail over the mechanical."

Now surely the teaching is not the same in both these instances, but would rather lead to opposite results, in the case of Mr. Petit rendering the architect chief workman, as he should be, and as the title imports, and in the other case the ornamentist only. To this separation of the constructor and deviser from the ornamentist, we have the greatest objection, as we have long ago and often expressed, and we shall be glad if Mr. Fergusson be led to show that his views are more in unison with our own in this respect than the paragraph we have quoted would seem to show.

Let us now give two or three disjointed opinions from the book. As to the *Stone Roofs* of the Middle Ages, Mr. Fergusson says, when speaking of the Roman Basilicas:—

"The roofs of these halls [the basilicas] had one

* "Being a concise and popular Account of the different Styles of Architecture prevailing in all Ages and Countries." In 2 vols. London: Murray. 1855.

peculiarity which it would have been well if the mediæval architects had copied, inasmuch as they were all honestly used as roofs without the necessity of being covered with others of wood, as all Gothic vaults unfortunately were. It is true this is perhaps one of the causes of their destruction, for, being only covered with cement, the rain wore away the surface, as must be inevitably the case with any composition of the sort exposed horizontally to the weather, and, that being gone, the moisture soon penetrated through the crevices of the masonry, and the stability of the vault inevitably became impaired. Still some of these have in Rome resisted for fifteen centuries all the accidents of climate and decay, while there is not a Gothic vault of half their dimensions that would exist for a century after the removal of its wooden protection. It therefore still remains a problem for modern times to construct a vault capable of resisting the destructive effects of exposure to the atmosphere. Until this is accomplished we must regard honest wooden roofs as preferable to the false stone ones which were such favourites in the Middle Ages."

Of the value of *Massiveness* in architecture, our author says:—

"Even when we descend to the lowest walks of architecture we find this principle prevailing. It would require an immense amount of design and good taste to make the thin walls and thinner roof of a brick and slated cottage look so picturesque or so well as one built of rubble-stone, or even mud walls, and with a thatched roof: the thickness and apparent solidity of the one will always be more satisfactory than the other. Here, as in most cases, necessity controls the architect; but when fettered by no utilitarian exigencies, there is no safer or readier means of obtaining an effect than this, and when effect alone is sought it is almost impossible for an architect to err in giving too much solidity to his building. Size and stability are alone sufficient to produce grandeur in architectural design, and, where sublimity is aimed at, they are the two elements most essential to its production, and are indeed the two without which it cannot possibly be attained."

The *treatment the ancient buildings receive in India* justly moves Mr. Fergusson's wrath. Alluding to Akbar's Palace, near Agra, he writes:—

"How much of this palace now remains it is impossible to say. When I was there the Government were selling the stones at 10 rupees the hundred maunds—a little less than it would cost to quarry them. I saw one of the noblest bowlees being so destroyed by the Company's servants, and its materials being carted away to build the wretched Barree of a neighbouring Zemindar. 200*l.* or 300*l.* might thus be added to a revenue of 22,000,000*l.* which, thanks to these Moguls, we are able to wring from the poorest peasantry in the world."

We may not now do more than repeat our thanks to Mr. Fergusson. Looking to all the existing works on the art, he was led to the belief that there was still room for another book, "which, without being too popular, should yet be intelligible in every part to the general reader, and, without attempting to be scientific, should from its comprehensiveness convey even to the professional artist, a certain amount of knowledge easily accessible to all." This want it has been his endeavour to supply by the Handbook now before us; and we most cordially, and indeed earnestly, recommend it to all readers.

UTILITARIANISM IN ARCHITECTURE.*

If the material employed by the architect be costly, it will not detract from the dignity of his work to show that he has appreciated its value, and economised it accordingly. He will prefer low reliefs to those strong and decided cuttings which give so much effect to stonework. In a fine group of statuary we know that half the block of marble has been cut and chipped away, and wholly lost; but then the result of this sacrifice is a high production of art, having a value far beyond that of the material, however costly. But the case is different with the lower departments of sculpture: we do not want to see a bunch of foliage, such as those which often form the capitals of Gothic pillars, cut in marble: stone is quite good enough for the purpose; and on this account our Northern Gothic, with its deep mouldings and large expenditure of material actually cut away and lost, is not, I think, a style to admit of the introduction of fine marble. The lamp of sacrifice does not require that we should destroy or throw away, as things of no value, the rare and beautiful materials which have been brought together at much cost, but that we should devote them liberally to the decoration of our edifices. I hope I may not be misunderstood in what I am about to say upon sculpture. Among the arts it holds the highest rank. We will not try to determine whether it is entitled to a place above painting or architecture. Their relative positions need not, perhaps cannot, be defined; and there is no necessity to exalt one in disparagement of another. But I conceive that in architectural compositions, sculpture is to be considered as exactly in the same category as costly material placed at the disposal of the architect. I repeat, I do not intend this as a disparagement; nor do the terms convey such an impression; for a rough piece of marble tells a more wonderful story than the finest composition of either sculptor or architect. But I mean, that the two arts are essentially distinct; that the architect is not necessarily a sculptor, nor the sculptor an architect, though the two have been combined in days when there were giants in art; and though the finest piece of sculpture of the present day applied to architectural purposes, that of the pediment of St. George's Hall, Liverpool, has been designed by one of our greatest architects, the excellence of an architectural design does not depend upon the excellence of its sculptural decorations. Its capacity, indeed, of admitting them may be regarded as a test of merit. The architect should know as much of sculpture as he does of the materials he employs; how to select, and how to dispose to the best advantage. He should know enough to enable him to do full honour to the noble art which he calls to his assistance. He should know how to direct the sculptor without imposing fetters on his genius, and how, by a graceful courtesy, to adapt his own designs to the better exhibition of those of his fellow workman. Thus the architects of the Greek temples gave them low rather than lofty proportions, lest the beautiful works which occupied the highest position in them should be lost to the eye, while the sculptor in his turn so designed his work as to give the greatest value to the architectural lines of the building. If the architect obtains the best sculpture and best material he can, and works up to them himself, it is all we can require of him. A commanding excellence in both arts on the part of a single individual is too rare a gift for us to look for except at long intervals; and we must not suppose that we are debarred from works of the highest architectural order when we are unable to command the aid of fine sculpture.

What I have said refers chiefly to statuary, but there is a peculiar branch of sculpture in which the architect should be particularly conversant, and, as far as this is concerned, I am quite prepared to agree with Mr. Garbett, when he says that an architect should design no decoration which he is not able to execute with his own hand. I mean conventional representations of natural objects. I may be allowed to repeat some remarks I took occasion to make at the last year's meeting of the Archæological Institute, in reference to the enriched capital peculiar to our transitional period of the end of the twelfth century, and to the French Early Gothic.

If we decorate a surface of wall by a wreath of flowers or foliage carved in stone, and supposed to be fixed to the wall, or hung on it as a festoon, the more closely we imitate nature the better: we should give all the flexibility and easy flow of line that the material is capable of: any conventional treatment will be solely for the purpose of more completely realizing the natural type. But when we have to deal with a block of stone that takes an important part in construction, the principle of utilitarianism must have its weight: however we may enrich it, we must never disguise the fact that it is a stiff, solid block of stone, such as we want in its particular position, and cannot do without. We may allow it, by its sculpture, to remind us of a bunch of foliage, or a human face, or a group of animals, or whatever else may give us pleasure, but we must not lose sight of its real nature and purpose: the rigidity of stone must not be altogether displaced by the soft and flowing outlines of animal or vegetable form: the features of the face forming the bracket must be hard and fixed; the foliage of the capital formal and severe, a suggestion rather than an imitation. In this respect I look upon those transitional capitals as the best that have appeared in any age, as combining, in happy proportions, the truth of nature with architectural propriety. This, I say, is a branch of sculpture that the architect must take entirely into his own hands.

I have often stated my impression, that the Gothic style, as being eminently characteristic of an age and spirit much differing from our own, is not likely to be successfully revived. And the fact that we have several modern Gothic buildings of great and unquestionable merit, rather strengthens than alters my view of the subject. When I can bring myself to look at these with the same interest with which I look at—I will not say an ancient Gothic building, but a modern railway shed, or viaduct, or any strictly utilitarian fabric, I may learn to think differently. Till then I fear all argument in favour of the present movement in that direction will be thrown away upon me. When but few modern Gothic works of merit were in existence, I thought the revival possible, and that a careful study of ancient examples might enable us to work in the ancient spirit. I now feel that if genius, talent, or knowledge could have ensured success, the revival would be already complete, and the charm of antiquity would alone be wanting to give the productions of the present day an equal interest with their mediæval predecessors.

One cause of the failure we have already touched upon. Picturesqueness is the very soul of Gothic architecture. The architects, I presume, did not aim at it, probably never troubled their heads about it, perhaps had not even any word to express it. They aimed at beauty, solemnity, and an imposing effect, and knew how to obtain it; but the picturesqueness came naturally and without intention. It was a part of the character of the age. Whatever they did was necessarily picturesque: they could not help it. Perhaps a future generation may find out some pervading characteristic of our own age, of which we are unconscious, and have not any word to express. Now we *aim* at picturesqueness; we discover in it a great source of beauty, and therefore endeavour to obtain it by every means in our power. Our love of it is shown in imitations of Swiss cottages, Italian villas, buildings crowded with gables, and all sorts of useless projections that may give a varied outline, and productions of the most fanciful and incongruous nature. But an artificial picturesqueness, as we have observed, is all but valueless; and when it is artificial, it is almost impossible to disguise it: we see at once whether the effect results from the honest adaptation of a building to its professed purposes, and its truth of construction, or from artifice; and we esteem it accordingly.

But it may be said, the innate excellence of the Gothic style, independent of either its picturesqueness or its associations, is sufficient to entitle it to our adoption.

Let us examine this point impartially.

Its principles of construction are undeniably sound and good. Enormous steeples are raised into the air: vaults of stone are thrown over vast spaces at almost incredible heights, with perfect security and great economy of material. If large stones are not to be procured, those of the smallest size are equally available, even in the production of the most extensive structures, and the system of ornament harmonises with the construction: it does not, as in the Italian style, suggest a wholly different manner of construction; it generally illustrates it, and often repeats it. The excellence of its conventional sculpture, at an early stage, we have noticed; and its lively and spirited representation of natural objects is beyond all praise. Of its acknowledged grandeur and solemnity it is needless to speak, or of the beauty of line and proportion which it develops to the spectator.

But it is not without defects, and those such

* See p. 37, ante.

as the natural and inevitable progress of the style would tend to increase.

The chief of these is, that endless subdivision of material by which a block of stone is reduced to thin bars, or even threads; a system which converts into a rapidly perishable substance, one which, if treated fairly, is the most durable we can procure. The great mechanical principle of Gothic architecture, namely, the concentration of weights and forces upon certain points, while it has secured to that style its proudest triumphs, has also implanted in it the elements of decay, by its constant tendency to lead to this indefinite subdivision. The structure becomes a vast framework, with open spaces to be filled up; and the same system is carried on throughout these. Thus we have windows of delicate tracery, open galleries on shafts, arcades, and panelling; pierced parapets, pinnacles and steeples composed of ribs, the decay of which is further hastened by their grooves and mouldings. How seldom do we see an old Gothic building that has not undergone the process of restoration, or is not pronounced to require it. I cannot call to my mind a French cathedral without scaffolding around it. Rheims Cathedral, though not built of a perishable stone, had the whole front of its south tower concealed by scaffolding from top to bottom. I suppose it is undergoing a thorough repair; and I heartily wish it may come well out of it. And how difficult do we often find it to obtain a true section of mouldings even in a well preserved church, owing to the decay of the stone.

It may here be as well to touch upon the question, whether the pointed arch,—the characteristic feature of the Gothic style,—be an improvement in construction upon the round arch. It is probable that some advantage in construction, real or supposed, led to its use; for, as Mr. Sharpe has shown us, in our transitional buildings the arches of construction are pointed, while those of decoration are round. At first sight we may imagine, that a range of pointed arches has more strength for the support of a heavy mass of wall resting upon them, than a range of round arches, since the curve of the circle does not seem so well calculated to resist a vertical pressure as the point formed by the convergence of the branches of a Gothic arch; and if the weight above could be considered as a beam resting upon these points, no doubt the pointed arch would be the best, and the more pointed, the stronger it will be. But in fact, the weight rests not only upon the top, but upon the sides of the arch, and may be so disposed as to cause a preponderating pressure upwards, in the direction of the tangent of the curve at the point of the arch, in which case the pointed arch, instead of being the strongest, will become the weakest, for the round arch would more readily carry the disturbing force to the point where it would be effectually resisted. I take it that in ordinary positions the round or pointed arch may be used indifferently; but a pointed arch is rightly used where there is a decided weight on the vertex, beyond that immediately on each side of it, as, for instance, a pinnacle; and the round arch, unless I am mistaken, is best when the wall sustained is bounded at the top by a horizontal line at a small distance from the crown of the arch. A bridge, for instance, should generally have round arches: if they are pointed, there ought to be a considerable space between their highest points and the line of the road. The pointed arch is useful in barrel roofs, where it is expedient to place the outer covering in contact with, or as near as possible to the shell of the vault. Such roofs are common in buildings of the twelfth century, in the south of France, which, in most of their features are far more Romanesque than Gothic. We find them too, in Jersey, the parish churches of which, plain and simple as they are in ornament, are admirable in their outline, and well worth our study as regards construction. And the pointed arch is useful in enabling us to throw out narrower lateral vaulting cells from a cylindrical roof, keeping the line of intersection between the two vaults in a single vertical plane, which cannot be done if both the large and small vault be cylindrical. These pointed cells occur in buildings of revived Italian, which make no pretence whatever of Gothic.

Much more might be said to prove the value of the pointed arch in certain positions; but I think it equally clear that the round arch is the best in many others, and it seems by no means proved that, by discarding the round arch altogether in favour of the pointed, a decided advantage in construction is gained.

We have noticed, as a merit, that Gothic ornament harmonizes with and illustrates the construction. But it is no merit that it repeats it and imitates it in miniature to the very verge of puerility — a vice justly condemned by Mr. Garbett. Shafts, arches, canopies, form even minute ornament: niches are vaulted with cells and ribs like the choirs of cathedrals. This may ensure a rich effect: it does so in the front of Rouen, to which we have referred; but it certainly does not conduce to durability. It is not treating the material fairly, or making the most of it; and however it may exercise ingenuity, I doubt if it tends to the advancement of true art.

But you may say it is in the later styles that this vice is carried into excess, and not in that which the architects of the present day are most inclined to adopt, and to keep it in a fixed position—the Early Decorated of the end of the thirteenth century. Very true; yet in that very period the foundation of the evil was laid. It was then that tracery, that beautiful element of decay, was developed; that the system of reduplication was established, of which the east window of Lincoln Cathedral is an eminent example; and the enrichments of some of the exquisite pinnacles and buttresses of that period could not fail to lead to a vicious extension of the same system.

As regards the tracery of the geometrical decorated, I must notice at least one defect, which, though tolerable in a progressing style, ought not to be endured in one we would consider as finally settled. I mean the inartificial—I might say clumsy—combination of the circle with the pointed lights. When it occupies the head of the window between two lights, it very frequently rests upon the sides of the arches, leaving the points disengaged, and projecting into a space of an irregular and somewhat ungainly form. For you will observe that it very seldom rests upon the points, and if the lights have equilateral arches, the favourite shape in those days, the circle cannot rest upon the points, unless it be the width of the whole window, and consequently cannot be introduced at all into the head, if the main arch be not stilted very much above the spring of the subordinate arches. This is done at Notre Dame, Paris, but the effect is far from pleasing.

Now, though a great architect might overlook a blemish, or postpone its correction for a time, in his pursuit of some excellence, yet he will never quietly acquiesce in it, and contentedly submit to its presence when he has leisure to turn his attention to its removal. The mediæval architects evidently did not. They first exhausted all the forms of beauty which the combination suggested, but then felt uneasy at the presence of the still unremoved blemish, though far less conspicuous in some compositions than others. The manner of disposing of the subordinate or incomplete openings in the head of a window seems always to have been a difficulty, the struggle with which gave rise to an infinite variety of design, and led the way to many important changes of style, but has never yet, I think, been brought to a successful termination. In Decorated windows we see some extremely curious attempts to meet the difficulty.

Had Gothic architecture remained in the state in which we find it in French churches, especially those of small dimensions, belonging to the thirteenth century, it would have been difficult to find in it any essential fault. It possesses considerable breadth and simplicity, and has less tendency to that subdivision of which we have spoken. It is solid and severe. Its mouldings, though presenting little or no variety, are bold and effective, and offer less that can sustain injury from the action of the atmosphere than our own more intricate mouldings of the same period. Of the excellence of the conventional sculpture we have already spoken, and in many districts the natural types are given freely and distinctly. The windows, of a single light, are of greater width than in our Early English, and consequently, less frequently grouped together. The triforium stage is often left blank, or pierced only with a few openings. The piers are massive, the vaultings well turned, and well supported by abutments. The composition is generally good and unaffected, and the proportions pleasing. I was much interested last autumn with a group of these churches on the Marne, some of which, though without much ornament, and in rather a rough condition, might be pronounced perfect models. Still, as the cross vaulting and buttresses were used, the framework system existed in them, though it was not prominently put forward; but in larger buildings it developed itself more fully. First, triforial openings, and belfry windows divided by shafts, exhibited the principle of subdivision (these, indeed, were used before the pointed arch was fairly established); then, single windows were grouped together under a comprising arch; openings pierced in the head, and finally bar tracery brought to its perfection.

I have spoken of the central tower as being a good architectural feature, on account of its supports and abutments being the actual walls of the building: the wall, in fact, which is necessary for the purposes to which the fabric is assigned, takes an active part in construction. But by far the greater number of supports in a Gothic edifice — I speak of northern not of Italian Gothic — are altogether extraneous, the buttresses externally, and the piers internally: the walls, though of the same solid material with the framework, take little or no part in its office: their strength is not turned to so much account as that of the walls of the plainest room in a house, which are made to support its roof. That the system of piers and buttresses has led to most beautiful combinations cannot be denied: still it ought not to pass without comment, when we are choosing what we intend to be a permanent style of architecture. We should also consider what style will give a church the greatest dignity when placed among our ordinary houses. For, however small, plain, or simple, it ought never to look mean in comparison. But I doubt if it is possible to prevent a Gothic church, unless it be of cathedral dimensions, from looking mean among our London houses. For height is the characteristic of Gothic. If the lines are so disposed as evidently to give the greatest appearance of height, and yet the real height palpably falls short of numberless buildings at hand which make no such pretensions, the impression on the spectator is, to say the least, unsatisfactory. The building which would best hold its ground in such a situation would be a Greek portico or colonnade of somewhat massive proportions. Next to that would be something of the character of certain railway sheds I have seen, with large round-headed windows of excellent form, the arch being of two orders, and a flat pilaster occurring in the spaces between the windows. There wants only a little expansion and enrichment of the cornice to convert these purely utilitarian erections into fine architectural works. It is, you may readily believe me, from no spirit of prejudice, nor from any wish to discover faults where so many acknowledged perfections are found, that I have dwelt upon what I consider blemishes in one of the most admirable and marvellous developments of human genius which has ever been witnessed. I should not have noticed them in treating of the Gothic style as one in constant progress, as it was during the period of the Middle Ages, nor if it now only existed in the remains bequeathed to us by our ancestors; but when it is proposed to adopt it permanently as our own, then it behoves us, however invidious the task, to look critically into all its defects and blemishes. And if we are finally satisfied to put up with even the slightest acknowledged defect, if we are not determined to remove it, or to abandon the system in which it exists, we are without the spirit necessary for the advancement of art. It little matters whether we call our works Edwardian or Palladian, they will soon dwindle away into insignificance, or remain only to perpetuate our shame.

The defects of the Roman and revised Italian styles are, I think, far more serious, in an artis-

tie point of view, than any which can be attributed to the Gothic, but they are not so intimately inwoven in the system. If by their removal the style would cease to be Italian, it would still remain a very good style, and one of great promise, though as yet far from complete. I am not urging the invention of a new style, but the development of one whose elements have existed, and that not in a state of inactivity, ever since the first use of the arch. The railway sheds I have mentioned, the Cornhall at Lille, the front of St. Luke's Hospital, the chapel of the Foundling, the church of St. Benet, abundantly prove to me the possibility of such a development. For plain buildings we have already all we want: the selection and application of ornament require the mind of a master.

I will now conclude by repeating briefly what it has been my object to inculcate. That a strict attention to the purposes of the building you design, a sound principle of construction skilfully carried out, and the knowledge how to make the most of the material entrusted to you, with the resolution to do so, will ensure a certain degree of excellence, and probably be the foundation of much more. By themselves they may not raise your work to the rank of an architectural composition, but they will be a sure groundwork for rules which may enable you to place it in the very highest order. If you value picturesqueness, depend upon it that what results from these elements, without your aiming at it, or thinking of it at all, is the only picturesqueness worth anything. Of real beauty and sublimity the only sure basis is truth, and that is the very thing I am recommending. This will teach you to give propriety and meaning to your purely architectural ornaments, and to dispose in the best manner, both for themselves and for your own work, those which you borrow from a sister art; and whatever style you may adopt, it will urge you to purify it of its errors in the best way you can, rather than to rest quietly and contentedly under the conconsciousness of their existence.

J. L. Petit.

"BREADTH" IN ARCHITECTURE.

Will you afford space in your periodical for a few observations from a non-professional, induced by the excellent article on "Nash, Schinkel, and Modern English Architecture," which I read with some interest in your journal not long ago.*

I am not about to venture on any purely architectural remarks, nor yet to attempt any defence of Mr. Nash's claims to talent or genius in his art, although I *do* think that professional rivalry, and also some degree of soreness, at his having enjoyed so large a share of royal and other patronage, may in some degree have led to his faults being exaggerated, and his merits ignored or depreciated beyond what in justice he deserved. Taste he most certainly had; and although it might have been more favourably displayed *within* than *without*, yet I am far from being convinced that the present external appearance of Buckingham Palace is a very great improvement. But what I am about to advert to in respect to the article in question will be the observations therein contained upon Breadth —that quality "so difficult to define in words," but so valuable, so almost indispensable an element in any work of art, be it painting, sculpture, or architecture (and I would add poetry and music also), that its absence, to one who has learned to relish and appreciate it, can hardly be atoned for by any other excellence, be it ever so great. But how rare is it—how seldom do we meet with it in either of these arts—more especially of modern days? The ancients, and in particular those marvellous old Greeks, are still immeasurably ahead of all who have succeeded them—at least, in those remains of architecture and sculpture which have escaped the ravages of time. How are we to account for this? Was the cause in the artists themselves, or had external influences their effect in producing, or at least in aiding, the development of this quality? And might not their habit of being so much in the open air, and of course viewing objects much under the "skyey influences," have so acted upon the organ of vision as to make it more than ordinarily capable of feeling this quality,—in fact, of rendering it a normal and as it were natural state, "operating itself unseen," so that they did that unconsciously, as it were, which we often strive to obtain intentionally, but often without realizing? I sometimes think so; and my opinion would seem to be countenanced by the remarks in the article in question, on the advantage to be derived from the study of landscape-painting, as forming part of an architect's education. Did not Gainsborough's practice as a landscape-painter contribute to give that great degree of breadth we see and admire in his portraits? And many of Reynolds's best works are those in which landscape forms a considerable portion; executed, too, in a style which proves that he must have devoted no small share of attention to the study; and, indeed, there is nothing so well calculated to train the eye to perceive objects in a broad, harmonious unity of effect.

An architectural design should, in my humble opinion, carry breadth on the face of it, even in outline; and I would have committees or other parties inviting designs to be sent in for any proposed building, insist on such being executed in one colour alone—*sepia* or *bistre*—or at the utmost with a sparing use of indigo, just sufficient to create a slight opposition of warm and cool tints.

G. J. R.

* Vol. xiii. p. 383.

SIR JOHN VANBRUGH.

I have been greatly pleased with the information to be found from time to time in *Notes and Queries* respecting Sir John Vanbrugh, of whom I have something new to tell, and about whom I am still desirous to know more.

Sir John was buried in that masterpiece of Protestant church architecture, St. Stephen's, Walbrook, in London, as appears by the parish register:—

"1726. March 31. Was buried S^r John Vanbrough in y^e North Isle."

Why was he buried in Walbrook? The inference is that his family was in some way connected with the parish; and this inference is confirmed by the parish register, for the following extracts from which I am indebted to Mr. Crosby:—

"1628. Sept. 25. Was bapt^d William y^e sonn of Gillis Van Brugh and Mary his Wyff.
1631. Aprill 27. Gyles, the sonn of Gyles Vanbrugh, Marchaunt, and Margarett his Wyfe, was baptysed.
1656. Nov. 13. Was borne a still borne child of Mr. William Vanbruggs.
1657. Jan. 1. William, the sonn of Mr. William Van Brugg, Marchant, and Mary his wife, was baptised.
1659. July 6. Was born Dudley, the sonne of Mr. William Vanbrugge, Marchant, and Mary his wife, and was baptised the 13^th July."

These, I am informed, are the whole of the entries in the register of St. Stephen's, Walbrook, relating to the Vanbrugh family.

These extracts are important. Of Giles Vanbrugh, the son of a merchant in Walbrook, we are told that he married Elizabeth, daughter of Sir Dudley Carleton, of Imber Court, in Surrey; hence doubtless the Christian name of *Dudley* mentioned in the above extracts.

Mr. T. Hughes, of Chester, tells us (*N. and Q.* 1^st S. viii. 232) that Giles Vanbrugh died at Chester, and was buried in Trinity Church, in that city, July 19, 1689.

Was this the father of the dramatist and architect? I suspect he was. Has his will been looked into?

I have examined Sir John Vanbrugh's will in Doctors' Commons. In his will he mentions two brothers, Charles and Philip (Captain Philip Vanbrugh is a subscriber, with Sir John, to Tickell's "Addison," 4 vols. 4to. 1721), and three sisters, Mary, Robina, and Victoria. Two of these names are unusual. They should serve as a clue to the discovery of the father of the dramatist. Will Mr. T. Hughes, of Chester, kindly inform me if Robina and Victoria are among the names of the daughters of Giles Vanbrugh, baptised in Trinity Church, Chester?

Let me add, that the extract from the "Life and Death of Matthew Henry" (1716), printed in *N. and Q.* (1^st S. viii. 480), confirms the supposition that the father of the dramatist was connected with the city of Chester.

Sir John wrote his name in *three* different ways: Vanbrook, Vanbrug, and Vanbrugh. I have seen instances of all three.

There were yet other ways of spelling the name. I have seen it as Vanbergh, Vanbright, Van Beringbrooke, and Van Berenbrocke.

Philip Van Berenbrocke was made one of his Majesty's falconers by warrant under the signet, dated April 22, 14 Charles II. and was paid as such by the Treasurer of his Majesty's Chamber. Giles Vanbrugh (we are told by the biographers of the dramatist) was Comptroller of the Treasury Chamber. But this I doubt. Was there such an officer?

I will ask leave to add another note about the Vanbrugh family, hitherto unnoticed:—

Register of Requests, 1660—1670, *Add. MS. Brit. Mus.* 5759.

"5 May, 1663.

"John and James Vanbergh.

"That y^r Pet^rs are both twinnes, and borne in London, and for some yeares past have employed a stock left them by their grandfather in a course of merchandizing. Yet some, out of spight, go about to hinder their trading, in regard their father was an alien, though their mother an English woman, and themselves have not attained y^e full age of xxj yeares. Prayes y^r Ma^tyes dispensacon w^th their innocent disability, and that they be permitted to trade, &c. His Ma^ty having beene moved in this Peticon, his pleasure is, that Mr. Attor^y, or Mr. Sol. Gen^ll, doe prepare a Bill for his Ma^tys royal signature, cont^g a grant and liberty to y^e Pet^rs to traffiq, as by them is humbly desired."

Peter Cunningham.*

* From *Notes and Queries*.

THE ABBEY KITCHEN AT FONTEVRAULT.

I am surprised that so accurate an observer as Mr. Petit, and one so intimately acquainted with French antiquities, should mistake the kitchen of the Abbey at Fontevrault for a chapel, particularly as it is so well known a specimen of the abbey kitchen, and so closely allied in form to that at Glastonbury. It will be found carefully figured in Mr. Hudson Turner's volume on "Domestic Architecture," as well as in several French antiquarian works. Its construction scarcely answers to M. Petit's description, inasmuch as the apses, or fireplaces, are attached to the *sides* of the octagon, each side having its own arch and apse. The appearance of their attachment to the *angles*, is only external, and arises from the peculiar manner in which the diameter of the octagonal spire is reduced at its base, from that of the primary octagon, first by reducing it to a square by four arches springing from alternate angles (much as those described by Mr. Petit in the tower, at Antwerp), and then by small arches, or "squinches," across the angles of the square as usual in ordinary spires. This has the effect of changing the direction of the sides of the octagon, and making the fireplaces appear externally to be placed against its angles instead of its sides. Mr. Turner says of this part,—"Between the top of the apsidal vaults and the springing of the spire, there is an interval of modern masonry, and it is here that the shafts of the chimneys have been cut off. It would appear that they were originally carried up in straight shafts, resembling pinnacles round the base of the spire, but there is no positive evidence of this. The flues cannot be traced more than a few feet from the lower opening, but two artists who have furnished sections of the building have both drawn the flues straight up as far as the base of the spire, where they appear to be cut off." The arrangement of these flues probably influenced the design, and should be taken into account in estimating its merits.

I only trouble you with this notice of an accidental error, which you will no doubt have observed, from the feeling that in utilitarian criticism a knowledge of the uses of the building is essential; and because in this case the external appearance has led to a misapprehension of the actual construction. I have no

doubt that the object of this somewhat intricate contrivance was to add strength to a pyramidal stone roof of upwards of 40 feet in diameter, and to bring down its bearing to a level only half way up the walls, instead of their top, which would have been in all probability incapable of sustaining it. G. G. SCOTT.

I presume I cannot have mistaken the building alluded to, though on second thoughts I can scarcely fancy its being taken for a chapel, particularly as no allusion is made to the pyramidal roof, its most striking feature. I must plead guilty of the frailty of finding one's thoughts, towards the close of an archæological day, insensibly turning from the subject in hand towards a modern and strictly utilitarian *cuisine*, and possibly such may have been the case in the present instance.

HOW TO MAKE A FIRE IN A COMMON GRATE WHICH SHALL SAVE HALF THE COAL AND BURN THE SMOKE.

CLEAN out your grate: cover the bottom with a sheet of paper, cut or folded to fit: place your coals in the grate to the level of the top bar, keeping the larger ones to the front to prevent waste. Light your fire on the top, and allow it to burn downwards undisturbed. An ordinary fire, prepared and lighted in this way, will, according to the size and form of the grate, burn six, eight, or ten hours without any renewal of coal, burning brighter and warmer than if lighted from below, as fires are ordinarily made.

The coal should be tolerably equal in size, something like Macadam stone: place the large to the front, the small to the back. The paper is put in the grate to prevent any air rising through the bottom bars. The fire is lighted on the top, and made to burn downwards, to prevent rapid combustion, and to keep the heat at the surface,—the coals, "cinder," or "coke;" and, if undisturbed, the combustion will be so complete, that there will be no waste ashes.

The grate must be cleaned each morning, and the paper must be renewed on the bottom of the grate as it is burned when the fire reaches the lower stratum of coal. The writer and his friends have made their fires, as described, for some weeks, and can vouch for the "saving of coal," the cheerfulness and warmth, and freedom from smoke. In principle, this mode of fire-making resembles that in Dr. Arnott's patent grate, which is fed from below: any smoke must ascend through the fire; and, in doing so, is burned. Some grates may present more difficulties than others, and servants object to the innovation. It is "*beggarly*:" it is "*mean*," &c. My servants, now they have learned how to make such fires, approve of the plan, as "*the grates are not so dirty nor so difficult to clean as formerly*." Think of saving half the coal and most of the smoke from the 300,000 house fires in the metropolis! This is a smoke-consuming feat worth advocating, and, with individual attention and care, may be accomplished. Kitchen fires must, I fear, be exceptional.

ASSISTANCE TO THE EYE IN THE PERCEPTION OF COLOUR IN PICTURES.

EVERY one knows that owing to the peculiar relation that colours have to each other, it is difficult, in arranging a collection of pictures, to prevent them injuring one another: but the fact is not "so generally familiar, that *the impression produced by a colour upon the eye does not cease immediately the eye is removed from the colour*."

Mr. Sydney Smirke, A.R.A. has recently addressed a letter to Sir Charles L. Eastlake, P.R.A. directing attention to this circumstance, and suggesting a remedy. "Let any one," says Mr. Smirke, "who wishes to receive a full measure of enjoyment in a picture gallery hold in his hand a *tablet painted of a neutral tint*, on which to rest his eyes as he passes from one picture to another. Has his eye become inebriated by some florid colorist? A draught of the neutral tint on his tablet will sober it down, and bring it to the full use of its senses. Has he been contemplating a glowing Italian sunset, or 'A Masquerade at Naples?' a glance at his tablet will prepare him for the next picture, perhaps 'A Mist in the Highlands.' By means of his tablet his eye becomes, on each occasion, a tabula rasa,—a cleansed pallet, prepared to receive a fresh assortment of colours. Its discriminating powers are restored; its bias corrected; and thus each picture will stand on its own merits, unimpaired by the disturbing effects produced by the impression left behind by the subject of the spectator's previous examination. A late eminent medical writer on cookery recommended that a saline, or other appropriate draught should be administered to the cook on the eve of a banquet, so that his, or her, taste might be purified and rendered so sensitive as to secure to each *entrée* and condiment the exact flavour that shall best recommend it to the fastidious gastronomer. Very analogous to this would be the operation of the proposed tablet upon the powers of the eye: it would 'purge the visual ray,' and so fit it to discern and appreciate the niceties of the colorist."

In the case of landscapes, where it is desired that the eye should appreciate tints of green, the writer suggests that the reverse of the tablet, a blank page in the catalogue for example, where there is one, should be coloured with a deep, pure, but not bright, *red*. Let the eye absorb a dose from this side before it contemplates a landscape, and it will be at once found to have been brought into a right condition for duly appreciating the artist's labour.

CHURCH-BUILDING AND PROVINCIAL NEWS.

Ely.—The cemetery works for the two parishes in this city are now ready for use. The whole works have been finished, including fencing and laying out of grounds, by Mr. R. Freeman, in about nine months.

Rougham.—The church here, which has long been in a sadly dilapidated condition, is now in progress of being restored. The arch of the tower in the interior was till lately blocked up by a cumbrous and unsightly gallery; but this has now been removed, so as to increase the area of the church and add the western arch and window to the view. The lower floor of the tower will now be converted into a baptistery. The nave roof, which has long been in a mutilated and dangerous condition, has been repaired. The roofs of the aisles have also been made secure. The stonework of the arches, pillars, windows, &c. is being divested of numerous coats of whitewash, the accumulation of ages, prior to being cleaned and restored. This preliminary process has brought to light a representation of the "Doom," or "Day of Judgment," over the nave arch, treated in the mode so generally adopted in the fifteenth century. The floor of the church is to be cleared of close high pews, to make way for oak seats, to correspond in style with the many old open seats that remain in the nave. A new carved oak pulpit, with desk attached, is also to be supplied. The centre floor is to be laid with red and black terro-metallic tiles; but the old monumental slabs will be relaid, and that bearing the brasses of Sir Roger Drury 1418, and Margery, his wife, 1405, will, by the re-arrangement of the sittings, be rendered more easy of access to the ecclesiologist. The works are being carried out under the direction of Mr. J. Johnson, of Bury, architect, by Mr. J. Rednall, jun. of Woolpit, contractor, at a cost of about 750*l*. to be raised by a rate extending over a period of six years.

Portsmouth.—A painted window has been placed in St. Jude's Church at Miss Selby's expense, in memory of a brother. The central compartment has the figure of the Saviour. The side bays are filled with figures of the four evangelists. The figures are somewhat larger than life, and stand in canopies of Gothic work. The remaining part of the window is arranged in architectural devices, interspersed with angelic figures. The window was designed and executed by Mr. Wailes, of Newcastle.

Titchfield.—A new Infant School here was opened on 17th ult. The vicar, during the past year, raised 300*l*. leaving 20*l*. to defray the cost of building the master's house and infant school.

Winchester.—Mr. Myers, the builder of St. Thomas's Church, having agreed to complete the tower and spire of it for the sum of 1,456*l*. his offer has been accepted by the committee for carrying out the work, which, it is expected, will be commenced in March.

Bristol. — Thrissell-street Baptist Chapel, which was destroyed by fire last winter, having been rebuilt, was opened on Wednesday before last. The walls have been raised, and the whole of the front wall above the entrance-portico, and which formerly stood back some feet, has now been brought out over and in a line with the front of the portico. This gives space for a deep front gallery. There are no side galleries as in the old chapel. This leaves the interior open. The pews in the body of the chapel, as also in the gallery, are low and wide; the whole made of deal, stained and varnished, with oak cuppings. The pulpit is large, and more like an enclosed platform than an ordinary pulpit. The roof of the chapel is partly open, being ceiled in a line with the collar pieces of the principals, the timber of which shows, and is stained. The body of the chapel is 48 feet long, and 38 feet 3 inches wide, and will seat 310: the gallery will seat 140. The elevation is simple: it partakes of the plain Italian style. In addition to, and against one side of the chapel, a school-room and class-room have been built, the school-room opening into the chapel, but having a separate external entrance. The original estimate for the chapel was 622*l*. to which have to be added the cost of the new school-room, and extra work, making a whole calculated at 870*l*. The architect was Mr. Henry Crisp, of Bristol; and the builder, Mr. John Neale, of Bedminster.

Liverpool.—On Monday before last, a certificate, acknowledging the completion of the last contract for the Liverpool Corporation Water Works, was given to Messrs. Miller and Lawton, the contractors, by Mr. T. Hawksley, the engineer. The contractors made their total account to be 51,288*l*. 11s. 1d. of which they received 33,000*l*. The remaining balance of 18,288*l*. 11s. 1d. contained some items which were disputed by Mr. Hughes, the deputy town-clerk of Liverpool, with whom there was also Mr. Statham, the resident engineer. It was expected, says the local *Times*, that the items would be investigated by the examination of witnesses who could speak to the various measurements, &c.; but on its being known that Mr. Hawksley had an independent record of all that had been done, both parties agreed to refer the accounts to his decision. The certificate of absolute completion is to be given when the reservoir is full, which is expected to be the case in a week or two.

Cockermouth.—A clock and chimes are to be put up in the tower of Cockermouth Church, at a cost of between 200*l*. and 300*l*. provided by Mr. Steel, M.P. and Mr. Wilson. The order has been given to Mr. Blaylock.

Wigan.—The local Poor-law Guardians have resolved, on the recommendation of the new workhouse building committee, that the works in connection with the new workhouse be let to one contractor, with a proviso that the sub-contractors named by him are satisfactory to the guardians or building committee; and that the tender of Mr. James Fairclough, builder, Wigan, to execute the various works in conformity with the specifications and contract, for the sum of 13,810*l*. be accepted, it being the lowest general tender offered. The tender of Mr. Fairclough in detail, omitting shillings and pence, is as follows: — For general trades, 13,810*l*.; including brickwork, 3,266*l*.; masonry, 3,437*l*.; carpenters and joiners, 4,434*l*.; slating, 827*l*.; plumbing and glazing, 1,022*l*.; plastering and painting, 821*l*. No time will now be lost in commencing the works.

Sunderland. — The extensive workshops belonging to Messrs. Lumsden and Sons, iron-founders, Strand, Monkwearmouth, are now in the process of being removed, and the buildings are being erected of iron. The sides, says the *Gateshead Observer*, are constructed of rows of flat iron pillars, the spaces between which are filled by stout iron wire. The roof is formed of an arch of corrugated galvanised iron.

Elgin.—Elgin, says the *Forres Gazette*, has begun again, after a short pause, to start in the

building line with vigour once more. On the 14th January contracts were entered into for a house in the Elizabethan style, designed by Messrs. A. and W. Reid, architects, and to be the property of Mr. James Watson, Lhanbryde, of the firm of Messrs. Urquhart and Watson, who have done much in the erection of new buildings to decorate the south side of the town. This house is to be erected at the east end. It consists of 10 and 11 feet flats, with four oriel windows in front, with an ornamented door-piece. The contractors for the work are,—mason and slater, Mr. F. W. G. Urquhart; carpenter, Mr. James Macbeth; plasterer, Mr. Jos. Stuart; plumber, Mr. John Gordon. Another building in connection with the North of Scotland Bank is to be raised on the site of the old Trades' Hall. Plans having been drawn by the Messrs. Reid, and approved of, it will be proceeded with. It will tend to improve the central part of the town.

LECTURE ON LABOUR, BY DR. WARREN.

The hall of the Hull Mechanics' Institute was filled, on the 3rd January, to overflowing, by a very attentive audience of all classes, who came to listen to an eloquent lecture by their Recorder, Mr. S. Warren, Q.C. on "Labour,—its Rights, Difficulties, Dignity, and Consolations." The lecture, at full length, has appeared in the *Hull Packet*, and Mr. Warren handed the MS. to the Mechanics' Institute authorities, at their request, for publication in a separate and cheap form.

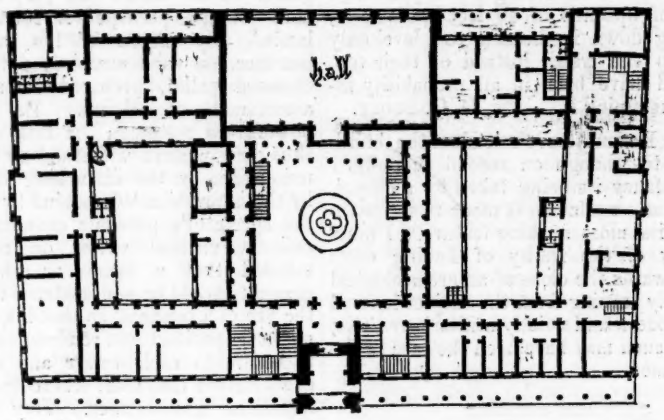
After some reflections on the general subject, in which the lecturer claimed for those engaged in mental labour a distinguished place among the working classes, he proceeded to treat of the rights of labour: these he summed all up in these words, "Labour in England, and in all her dominions all over the world, is free." In respect to our West Indian colonies, Dr. Channing, the American, was quoted on the conduct of this country in not only abolishing West India slavery, but doing it at a prodigious pecuniary sacrifice:—"Great Britain, loaded with an unprecedented debt, and with a grinding taxation, contracted a new debt of a hundred millions of dollars to give freedom, not to Englishmen, but the degraded African. I know not that history records an act so disinterested,—so sublime. In the progress of ages England's naval triumphs will necessarily shrink into a more and more narrow space in the records of our race, but this moral triumph will fill a broader, brighter page." But what, continued the lecturer, is really signified by the expression that labour is free in England? Simply this: that subject to two or three exceptions founded on reason, justice, and humanity, every British subject may work at any kind of labour for any person, anywhere, for any recompense, and for any space of time, that may be agreed upon between him and another. It is no longer ago than 1825 that all Acts were repealed which, under very heavy penalties, prohibited a British artisan from going abroad! He is free now, therefore, to compete with the artisans of the whole world in ingenuity and industry. And when I say that a man may agree to serve for any length of time, I mean that he may, if he choose, contract to work for his whole life, according to the law of England, which, in this respect, differs from that of France, where such a length of service is deemed inconsistent with personal freedom.

The man who sells his labour to another must perform his contract in every respect with as punctual good faith as is required from the party purchasing it; or not only lose all advantage from it, but subject himself to liability, either by a civil action or criminally, under the provisions of various statutes passed for the protection of persons carrying on great manufactures, who might be quickly ruined but for a summary remedy being afforded.

Some strictures were then passed on the practice of truck, and some remarks made on the restriction of the hours of labour, and the work of women and children. The evils resulting from trade combinations, were dwelt on at some length, and the past and present state of the law on the subject pointed out. The lecturer could suggest no specific for the malignant disorders connected with this culminating point in the freedom of labour, except that true Christian feeling which as effectually prevents as cures them.

Having taken a comprehensive, and he hoped a correct view, of the rights of labour, all really resolvable into its freedom, the lecturer proceeded to remark, that it had already been seen that the exercise of these rights of itself suggests many of the difficulties with which labour has to contend, and these often of a serious and severe character. Besides these, however, it had others to arm against. Ignorance and unwholesome dwellings were then dwelt upon at some length, in connection with their proper correctives and antitheses: so with improvidence and intemperance, on which latter subject the lecturer also expatiated.

The difficulties of labour were finally taken leave of, by a short quotation from Edmund Burke, as consolatory in hours of fatigue and depression:—"Difficulty is a severe instructor, set over by the supreme ordinance of a parental guardian and legislator, who knows us better than we know ourselves, as he loves us better, too!" With this healthy tone communicated to our feelings, continued the lecturer, let us approach the last department of the subject, and see whether labour, though it have its serious difficulties, has not also its dignity and consolations—aye, real dignity, and rich consolations. It was then boldly laid down, that with free and virtuous man there is no kind of labour that cannot be invested with dignity—a dignity depending on the spirit in which labour is undergone, the objects for which it is undertaken. Even compulsory labour, and designed to be degrading—the labour of the felon—might be performed with dignity, if the unfortunate labourer were conscious that he was the victim of injustice. In considering the consolations of labour, the speaker, in conclusion, gradually ascended from all other and more earthly consolations, to those higher and more secret sources of strength which brace the nerves, strengthen the arms, and support the heart of the virtuous workman; so that even should he lose the favour of an earthly master, he serves a heavenly one, whom he shall, by-and-by hear, when he has rested from his labours, saying—"Well done! thou good and faithful servant!"



PLAN OF HOTEL DE VILLE, HAMBURGH.

THE HOTEL DE VILLE, AT HAMBURGH.

The selected design for the proposed Rathhaus, or Hôtel de Ville, at Hamburgh, has many and great beauties, in spite of an objection to a portion of it, which occurred to us on first seeing the drawing in the Exhibition at the Royal Academy; and, when carried into execution, will increase the already sufficient fame of the author of it, Mr. G. G. Scott. Our engraving represents the principal front (the top of the spire being cut off, to prevent too great reduction of the view), and we add a small plan, to show the internal arrangement. The building will be a complete Government house, embracing all the various offices required for the different departments of the Government of an independent state and a great commercial city. The leading departments are as follow:—

1. That for the senate; comprising a large hall and several committee-rooms, offices, waiting-rooms, rooms for archives, &c.

2. That of the representatives of the citizens; consisting of a hall of great size, in which the senate and citizens meet every month for the discussion of matters of state; committee-rooms, and rooms for the representatives of the several parishes into which the city is divided.

3. The financial department; embracing that of direct taxes, those of indirect taxes, customs, excise, and stamps; offices for the regulation of trusteeships, the property-tax department, &c.

4. Law courts, both civil and criminal.

5. Miscellaneous public offices, such as offices for the regulation of partnerships, bankruptcy courts, the public archives, offices for matters relating to mortgages; those of the board of works; those for the registration of marriages, &c. and several other matters.

The Great Court, or "Gehege," would be used by merchants and others, who have business of a public as well as of a commercial nature; an off-shoot, in fact, of the Exchange, in the midst of the public offices.

THE NEW PRACTICE-RANGE, WOOLWICH.

The military authorities having found the present practice-range inconvenient and dangerous, from the fact of the firing being at nearly right angles to the Thames, it was decided some time since to purchase land to the eastward, and running more parallel to the river, by which means the fire of the artillery would not endanger the shipping, &c. as their range would be entirely within their own premises. The particulars of the contemplated works are briefly these:—

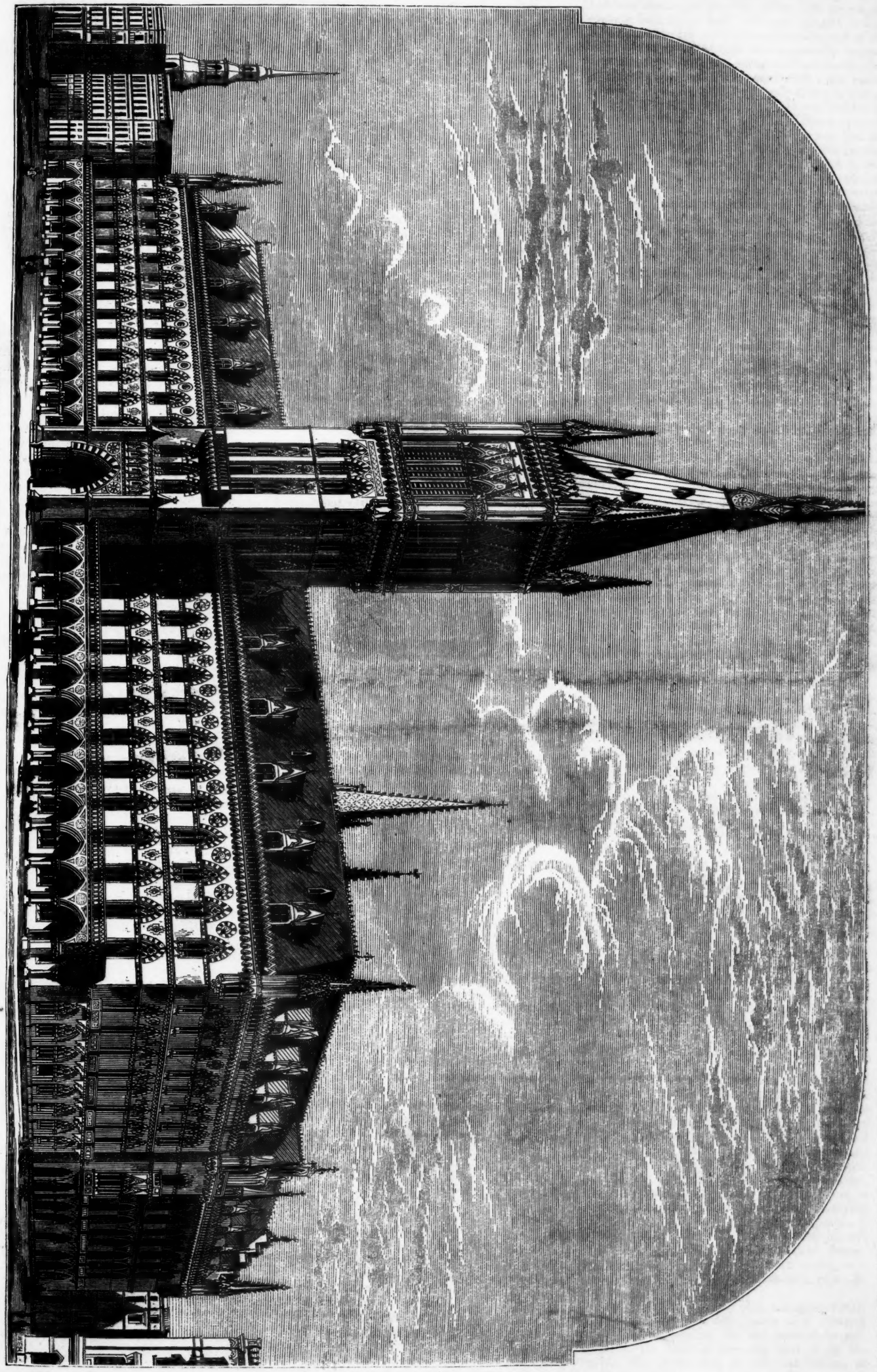
The new range will run in a direct line to the east of the existing artillery road, and will have at the western end a plain building, called the "Lobby," in which will be accommodation for a non-commissioned officer and gunners, also a guard-room, and room for the meeting of any committee that may be in attendance to report on experiments. Near to this are two batteries, one of which is for ten guns, the other for mortars. There are also two wooden batteries, representing the sides of a ship, pierced with port-holes, for the practice of naval gunnery. A martello tower will also be erected in the immediate vicinity of the foregoing. Two magazines and sheltered coverings, called "splinter-proofs," for the protection of the men engaged during the firing, are also provided.

One of the principal features of this large work is the Great "Butt," or mound, against which the practice of the artillery is directed, which is to contain nearly 46,000 cubic yards, and is to be constructed on a foundation of consolidated gravel and fascines. There is a bomb-proof range-room at the back, approached by "ramps."

To maintain the existing drainage of these marshes (a difficult thing to contend with), the trenches or ditches have been filled with old bricks, broken stones, &c. so that while a level surface is secured (which of course is necessary for military evolutions), the percolation of the surface water freely takes place through this rubbish drain.

The whole of the new range is surrounded by a wide boundary ditch, and bridges cross the intermediate fleets that intersect the range. The designs have been prepared by Mr. Stent, the newly-appointed chief clerk of works to the War Department, and will be carried out by Mr. E. Smith, the contractor. The service is under the military supervision of the Royal Engineers' Department.

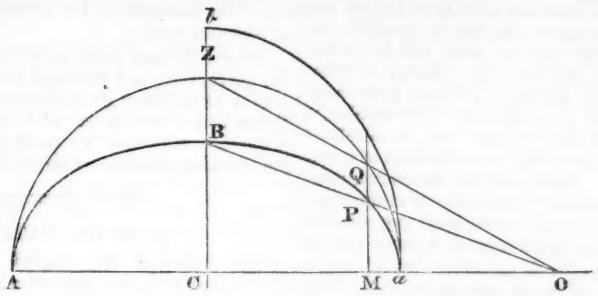
Value of Property in Pall-mall.—Messrs. Farebrother and Co. recently sold a leasehold estate in Pall-mall East, comprising the premises occupied by the Society of Painters in Water-colours, the entrance adjoining, with private residence, warehouse, and cellars, occupied by a wine merchant, private residence adjoining (No. 6, Pall-mall East), and ground-rents amounting to 58*l.* 5s. 6d. issuing out of chemist's shop and house adjoining, Dorset-place, the whole producing 940*l.* per annum, and held under three leases, expiring in 1919, at ground-rents amounting to 196*l.* 10s. 6d. per annum. It was knocked down at 10,800*l.*



RATHHAUS, OR HOTEL DE VILLE, HAMBURGH.—MR. G. G. SCOTT, A.R.A. ARCHITECT.

GEOMETRICAL PROPERTIES OF CONIC SECTIONS.

THE ELLIPSE.*



MANY of the properties of the ellipse may be advantageously considered in connection with the circle drawn upon the *major axis*, the centre of the ellipse being that of the circle; this circle is called the "circumscribed circle."

If we draw any line M P Q perpendicular to the major axis, M Q is called an *ordinate* of the circle, and M P an *ordinate* of the ellipse. There is an important connection between the two curves, namely, that *the ellipse is the circle with all its ordinates reduced in one and the same proportion*, which is that of C B to C Z or C A, or, *in the ratio of the minor axis to the major axis*. Hence it follows that M P : M Q= C B : C A. Therefore, if we have given the lengths of the axes, and we draw the circumscribed circle, we may find points on the ellipse, provided we can discover a means of reducing the ordinates in the ratio of the axes. By aid of the sixth book of Euclid this can readily be done.

Produce the axis A *a*, and draw from any point O on the axis produced O Z and O B, and from the point Q, where O Z cuts the circle, let fall a perpendicular on A *a*; then the point P, where Q M meets O B will be a point on the ellipse. So also any number of points may be readily found with the ruler only; for by the sixth book of Euclid, M P : M Q = C B : C Z.

This method of drawing an ellipse will be found more practical by draughtsmen than any other method.

If instead of cutting down the ordinates of the circle in one proportion we lengthen them in the proportion of C Z or C A to C *b*, then we shall have another ellipse, whose *minor axis* is the diameter of the circle, and the curve will be entirely outside the circle. Hence it follows that if we project a circle by means of parallel lines upon a plane oblique to its own plane, we shall always obtain an ellipse, since all the ordinates will be altered in one proportion.

It will be evident from what has been stated that if two circular vaults of equal radius intersect at right angles, they will form an elliptic groin at their intersection. It will also follow that if two cylindrical vaults of equal height, but of different span, of which the lesser is semicircular, intersect at right angles, the vault of wider span must be elliptic, in order that the intersection may be in one plane.

The perspective representation of a circle must always be an ellipse, or of a *portion* of a circle the corresponding *portion* of an ellipse; for the rays of light from a circle to the eye form a conical surface, of which the eye is the vertex and the circle is the base, and any plane intersecting this surface forms an ellipse at the line of intersection. This is an important rule to be remembered by architectural draughtsmen, if they would avoid distorting their arches in perspective views. E. W. T.

* See p. 6, *ante*.

CANDLE-MAKING.—GLYCERINE.

AT the Society of Arts on January 23rd, a paper "On the Manufactures of Price's Patent Candle Company," by Mr. G. F. Wilson, F.R.S. was read, wherein the writer said candles might be divided into four classes. 1. Beeswax, called wax candles. 2. Neutral fat, including spermaceti, tallow, and cocoa-nut candles. 3. Fat acid, known as stearic candles; and, 4. Composite candles, being a mixture of stearic acid and neutral fat. He explained that the reason why a tallow candle requires more than three times the size of wick to give the same amount of light as a stearic candle, was owing to the glycerine being present in the one case, and having been separated in the other; and he demonstrated, experimentally, that glycerine has the effect of reducing the illuminating power of candle material. To get rid of this was the necessity which first called in the aid of science to candle-making. Chevreul, the great chemist, may fairly be called the father of this application of science. His labours, begun in 1811, were collected and published in his "Récherches Chimiques sur les Corps Gras," in 1823. Two years later, he, in conjunction with Gay Lussac, sketched out the idea of the distillation of fatty bodies, and even touched lightly on the introduction of steam into the distillatory apparatus; but he did not succeed practically. Messrs. Motard and Milly, in 1833, first made fat acid or stearic candles commercially successful. Their process was called lime saponification, and was adopted by the English candle-makers, including E. Price and Co. It was, however, expensive; as, to each cwt. of tallow, 14 to 16 lbs. of lime, and 28 to 32 lbs. of sulphuric acid were employed. Subsequently, in 1840, Mr. G. Gwynne proposed the exclusion of the air by means of an air pump, from the apparatus while distillation was going on. Mr. Wilson then described the nature of the patents taken out by the company in 1842-3-4, for distilling cocoa-nut oil and its acids, for the distillation of fats previously acted on by sulphuric acid, or by nitrous gases, and for the use of diluted acid in direct acidification of fats. The author alluded to the important purposes which glycerine would subserve in the arts and medicine. For photographic purposes, the experiments made by Mr. Maskelyne and Mr. Llewellyn were most promising. In the Hospital for Diseases of the Skin, it had been long introduced by Mr. Startin. In Edinburgh it was being prescribed regularly. To show the extent of this company's operations, it may be mentioned that in the month of October last, employment was given to 1,098 men and 1,191 boys and girls, and that of stearic and composite candles, and night-lights, about 707 tons were manufactured, value 79,500*l.* in the month.

ON THE PAST AND PRESENT CONDITION OF THE THAMES.

INSTITUTION OF CIVIL ENGINEERS.

AT a meeting on the 22nd of January, Mr. Robert Stephenson, M.P. president, in the chair, the paper read was "On the Past and Present Condition of the River Thames," by Mr. H. Robinson.

Some of the principal statistical facts connected with the river having been enumerated, the writer said, the numerous shoals now exposed at low tide, the mud-banks covered with putrifying matter and animalculæ, the disgusting state of the water itself, the numerous crazy wood-propped wharfs, and the ricketty barges still serving for steam-boat piers, were referred to, as justifying the opinion, that were it not for the noble bridges spanning it, the Thames, within the limits of the metropolis, would be a disgrace at home and a reproach abroad, and it was remarked that in no town in the world was there a noble river so neglected and deformed.

The various schemes for embanking the shores were then alluded to, and the partial good already effected, was noted. Among the larger designs were those of Sir Christopher Wren, Mr. Martin, Messrs. Walker and Burgess, and others. The removal of the obstruction of Old London-bridge had seriously altered the condition of the river at or near low tide, not only by exposing shoals, which impeded the navigation, and, by leaving a very large surface of mud, giving off exhalations dangerous to health, but also, by so quickening the current, as to enable it to scour away the bottom, near to the foundations of structures built in the channel, and thus seriously endangering several of the bridges and wharfs.

The various causes which had induced the present polluted condition of the Thames were described to be, first, the demand made upon it to serve as a town sewer as well as a land drain. This would, however, have been of little moment, if London had been beyond the influence of the tide, so that the stream could have run always in the same downward direction; but, exposed as the river was to the ebb and flow of the tide, the impurities and sewage, which had been discharged into the ebbing tide, were again brought back by the flood. Nor was this all: in consequence of the low level of a considerable part of the London sewers, the sewage was necessarily stopped back for many hours, and egress could not be afforded, until the water had fallen considerably: the consequence of this was, that it was only during a portion of the ebbing tide, that the sewage was enabled to travel down the river, but it was returning upwards during the whole period of the flood-tide; so that the impurities not only returned to the place whence they started, but were even carried higher up; and it was asserted that some of the putrefying matter, exhaling pestilential odours on the mud-banks in Westminster, was actually discharged from sewers at Bermondsey or Southwark. A short history was then given of the steps taken by the late Commissioners of Sewers to remedy this putrid condition of the river. Mr. Frank Forster had arranged a system of intercepting sewers, by which the sewage of London was intended to be conveyed below Greenwich, and there discharged into the river, at an expense of one million and a quarter sterling. Nothing was, however, done, for want of funds: subsequently Mr. Bazalgette, under the orders of the commissioners, extended and completed the plans, and at an expense of three millions, laid out a system of intercepting sewers. The increased amount of the estimates rendered still more difficult the execution of the works, and nothing was done till the commencement of the past year, when public feeling loudly demanding some amelioration in the condition of the Thames, it was resolved to make at least a commencement; but all progress was stopped, the board disunited, and some of its most efficient members lost to it, by a controversy which arose regarding the size of the sewers. This controversy still continued, and involving, as it did, the question of economy, would probably still divide the new Metropolitan Board. These differences were, however, of the less importance, the writer thought, as there was little chance of such an enormous sum being raised at present for the purpose, particularly as the mere stopping the entrance of any fresh sewage would not cleanse the Thames, under many years, if at all, nor remove the acknowledged principal source of malaria, —the mud banks exposed at low tide. There was, therefore, every reason to fear that the salutary agitation which had been excited on this important subject would again die away, and leave the sewage undiverted and the Thames uncleansed, until a fresh visitation of malignant cholera again roused the public feeling.

The author's proposal to construct a chain of locks across the river, at, or near London-bridge, where the traffic was now divided, already mentioned in our pages, was described.

On the 29th ult. the preceding paper was discussed; and will be again considered on the 5th.

EPISCOPAL PALACE, BISHOP'S WALTHAM.

ABOUT ten miles from Winchester is the little town of Bishop's Waltham, founded, as its name declares, by the Saxons [*i.e.* wood town], unknown, perhaps, to the greater part of your readers, and yet containing many interesting memorials of the past, which would well repay an architectural visit.

The manor having been added to the see of Winchester by William the Conqueror, it gained the prefix of *Bishop's*. We find the first mention of it in the Doomsday Book:—"Ipse episcopus tenet Waltham in dominio. Semper fuit de Episcopatu." Leland speaks of it as a "praty townlet," where "the Bishop of Winchester hath a right ample and goodly manor place, moted about, and a praty brook running hard by."

At a short distance from the town stands the ruin of what was then the "goodly manor" or episcopal palace, founded about the year 1138, by Henry de Blois, brother of King Stephen, and then Bishop of Winchester, who, about the same time, founded and built the castles at Wolversly, Farnham, Merdon, and Taunton. It was here, "at the Bishop of Winchester's, Waltham," that Henry II. convened his nobles, and held a council of the realm; and it was here, at that council, that supplies were granted for carrying on the war in which he was engaged; nay, more, it was here, at that very time, that he made his will previous to joining his brother Crusaders of France. Here, also, our Lion-hearted monarch rested, on a similar occasion, on his way to Portsmouth, where he embarked, never to return.

We see it now inhabited by pigs, and approachable only through dung and filth; parts of it changed into stables and pigsties, the rest uncared for and dilapidated—the hand of time the least of its destroyers. Was it for such an end that William of Wykeham expended so much love and labour upon it? Could he have discovered that future bishops would

have looked upon it as it is, or that the mind's eye alone could trace his hand, in this 19th century of ours, what would have been his thoughts! As its dismantled walls look mournfully down, and memory holds us by the mental button, we almost wish the old days back again. No doubt, ignorance would be pleaded as an excuse, if any were questioned as to its condition. Might not the bishop, who has followed in the wake of so many distinguished by the glory of their lives, be prevailed upon to sacrifice a little of his worldly goods to rescue it,—if not for his own sake, at least for the shadows of the past?

But, still more disgusting than the condition of the palace, and not to be passed over on the plea of ignorance, are the modern improvements (!) to the church. Beautiful in itself, as all Gothic buildings in England are, with any claim to age, it is disfigured by the most monstrous architectural blunders I remember to have seen. A number of Gothic arches have been removed, to make room for a gallery supported on Tuscan columns, with the usual cornice, &c. I know not if an architect were employed: let us hope not.—X.

THREE HOUSES DESTROYED IN THE NEW-ROAD.

On Thursday in last week, while the gale of wind and storm were at their height, three houses were entirely crushed, and their inmates buried in the ruins, by the falling upon them of the immense mass of brickwork comprising the eastern and south-eastern walls of Messrs. Hopkinson's pianoforte manufactory, destroyed by fire on the night of Saturday and morning of Sunday, in the week before last. This manufactory was an extensive building six stories high, situate in the rear of Messrs. Gray and Davidson's, the organ-builders, in the New-road. The houses crushed stood immediately under the wall of the manufactory, to shore up which, it is said in the daily papers, that no steps whatever had been taken since the fire. Labourers being procured, several persons were speedily rescued who had received but slight injuries, whilst seven or eight were got out in an insensible state. The most serious case was that of a young woman, whose jaw was broken, and skull frightfully fractured, and who is since dead. It is remarkable, as well as fortunate, that of the seven taken to the hospital six were sufficiently recovered to leave in the course of the day. Several poor families have lost all their furniture by the occurrence.

At the inquest which has been opened by Mr. Wakley, the coroner, the question was raised whether (with reference to the New Building Act) the Commissioners of Police and other parties had acted rightly in permitting the walls to remain without being shored. It was ultimately decided that an architect should be appointed on the part of the jury to make a survey of the premises and report, and the inquiry was accordingly adjourned.

ON LARGE BELLS—UNISON.

The subject now occupying the attention of the Royal Institute of British Architects is "On the Forms, Methods of Casting, and Ringing of large Bells." This must, to a considerable extent, depend on matters of opinion, for if we suppose a long series of experiments are being investigated, under the direction of the most competent parties, to ascertain whether some totally different instrument for producing the sound of a bell might not be introduced, which would be much lighter, much less costly, and less likely to be cracked, the quality and fitness of such substitute must, after all their researches, principally depend upon the ear. Gentlemen who have successfully studied music all their lives will, of course, think they have a very sensitive ear, and that their acoustic organs are correct enough for all musical or practical purposes: this may be admitted, and also that the sound of bells may be correct enough for all practical purposes. But suppose a large bell be made to ring a certain note, and a mass of metal, of a totally different form from that of the bell, be made intentionally to give precisely the same note, some persons might say they were in perfect unison, while others might entertain a totally different opinion; and it could only be a matter of opinion with either party, for I am not aware of any method of proving which would be right.

It is almost impossible to determine quantities by the eye; but if two squares, or two circles, were represented near each other, and it should be doubted whether they were of the same dimensions, the matter in dispute could be easily proved by measuring them; but there is no mode of proving so accurately by the ear. A very ingenious instrument, called "the syrene," has been invented to determine certain matters connected with sound; by the use of which, the exact number of beats, or vibrations in a given time, may be calculated, and certain musical notes produced. Simple, complete, and correct in itself, as this machine appears to be, its application to determine the corresponding note of a bell, or other musical instrument, must rest entirely on the ear and the opinion of the hearer, whether he considers the two sounds to be precisely the same, and in perfect unison; that is, do they beat a like number of vibrations in a given time, which is a question more easily asked than answered to a certainty. The number of beats per second of the "syrene" may be calculated correctly, but who can count the vibrations of a bell or a harp-string? Such nicety of observation must rest with the expression, "I think the two sounds are alike, but I am not certain." No doubt any one with a highly-cultivated musical talent will do much towards determining such a difficult question; but up to the present time, practical proof appears to be involved in impenetrable obscurity. C. H. Smith.

GAS.

In consequence of the threatened formation of a Gas Consumers' Company at Willenhall, the shareholders of the existing company have authorized their directors, at the request of a deputation of gas consumers, to give such reduction in price as may seem fit. The directors, however, seem to entertain the idea that the limited consumption renders the granting of such a reduction as that desired unadvisable.——The lessee of the *Lincolnshire Chronicle*, who is a shareholder in the Lincoln Gas Company to a small extent, endeavours, in last week's *Chronicle*, to show the undesirableness of forming the threatened gas consumers' company, and holds out a prospect of a reduction in price from 5s. to 4s. or perhaps 3s. when the enlargement of their works is paid for.——It is proposed that the highest charge by the Gainsborough company, for gas supplied by meter, shall not exceed the rate of 5s. 6d. per 1,000 cubic feet, unless the cost of the best Silkstone coals at the Gainsborough Gasworks shall exceed 15s. per ton, in which case the price for gas shall be increased 6d. per 1,000 feet, and shall be further increased 6d. for every additional 5s. cost per ton of the said coals, or for any fractional part thereof.——Notice has been given of an advance from 5s. by the Southampton company, on the ground of a rise in the price of coals, the advance to take place on 1st January. An agitation is going on here, too, in favour of a consumers' company.——Mr. G. Flintoff gave lately a lecture at Hereford, on the gas question. In course of his lecture he stated that from a ton of coal 10,000 feet of gas are made, and after that has been extracted, 13 cwt. of coke remain, besides 10 gallons of tar, and 10 gallons of ammoniacal liquor. In Hereford, where gas was at 6s. he would estimate the ton of coal to cost 16s.; the 13 cwt. of coke would be worth 14s.; the 10 gallons of tar would sell for 1s. 3d.; while the ammoniacal liquor would run to waste: this would reduce the actual cost of raw material to 9d. for 10,000 feet of gas, being not quite 1d. per 1,000! The cost of coals had little to do with the cost of gas, because wherever coal is dear, an increased proportionate price is obtained for the coke. In London the cost of raw material for 10,000 feet of gas was 4¼d.; in Burnley, 3d.; and in Liverpool, 5¼d. In Boston, a place very similar to Hereford, the coal was 18s. per ton, and 16s. 6d. was got back for coke, tar, &c.; which reduced the cost of material to 2d. per 1,000 feet. Taking, then, these facts as they stood, there was no reason why Hereford should not have gas at 3s. per 1,000, because the cost of labour was in all places nearly the same. In some places the system of having gasworks under the management of corporations had been most successful. In Manchester there was a profit of 50,000*l.* per annum from this source, which was expended in paving the streets and improving the town; and they had also extended their light to the out-districts, finding that gas-lamps very effectively do the work of policemen.—A discussion followed the lecture, and a vote of thanks was passed to Mr. Flintoff.

The Colchester Encampment.—The new barracks in the Ordnance-field, Colchester, are now almost completed. A wooden church, to accommodate 800 to 1,000 men, is being erected in the old military burial-ground, near the camp. A building has been raised for a library. The camp is to be lighted with about forty oil-lamps till gas-lamps are got ready. Several fire-engines have been temporarily placed in the engine-house, till others of a more powerful description are supplied. The camp will partly be enclosed with a wall 12 feet high, and by a fence of oak pailing of same height. The Government Inspector has examined the works, and expressed satisfaction with the execution of the contract by Messrs. Lucas, Brothers. It is thought probable, from the size of the camp, that more hospital huts will be required.

FAILURE OF BUILDINGS.

Four newly-erected houses have recently fallen in Paddington, in consequence, it is stated, of the flooding of the basement by the escape of water laid on to an adjoining tank.

Other falls have lately occurred in the suburbs of the metropolis; and we would earnestly reiterate our caution often before given at this period of the year. Unless better *mortar* be used, and more care taken in quarters to which we could point, we shall have some serious accidents to record before long.

BUILDING PATENTS.

The following are selected from lists in the *Mechanics' Magazine*, and other sources. All except the last are specifications of patents recently filed:—

Lee, Henry, jun. of Lambeth, contractor, and John Gilbert, of Hackney-road, engineer. "Certain machinery for mixing the substances used in the formation of concrete and other like substances." Patent dated May 2, 1855 (No. 986). This invention consists in mounting a cylinder or case upon a shaft, and in providing such cylinder or case with an aperture and cover which forms both the feed and exit passages for the materials. Rotary motion is communicated to the cylinder, and after having been continued a sufficient time, the cylinder is stopped with the aperture downwards, the cover is removed, and the concrete runs out.

Hamilton, John, jun. of James-street, Liverpool. "Improvements in the construction of iron girders." Patent dated May 4, 1855 (No. 999). In this invention a series of corrugated sheets of iron are used in constructing the upper part of a girder, fastened together, and kept at a distance apart, and parallel to each other, by transverse partitions of wood or iron, with undulations to correspond with and fit the corrugations of the sheets.

Newton, A. V. of Chancery-lane. "Improved machinery for manufacturing bolts," &c. (a communication). Patent dated April 20, 1855 (No. 888). Iron of a size corresponding to that of the head of the finished bolt, or slightly smaller, is heated and submitted to the action of certain dies, after which it is carried to other dies, and the shank is drawn down. The form of the shank is then perfected by a cylindrical die, and the bolt is severed from the bar by other dies. The head is then perfected by a heading die.

Bowron, James, of Tyne and Tees Glass-works, South Shields. "An improvement in the manufacture of glass tiles." Patent dated May 8, 1855 (No. 1,031). *Claim.*—The manufacture of glass tiles by pressing them from fluid glass, instead of first making the glass into sheets and then shaping it.

Muller, Emile, civil engineer, Joseph Gilardoni, and Xavier Gilardoni, of Rue de Provence, Paris. "A grooving and clamping hooked tile, by means of which the entire covering of a roof is tied together. A machine, for the fabrication of such tile, by which it is continuously delivered from the mould through a peculiar system of delivery, applicable to any matter that may be moulded, and a continuous succession of furnaces for its burning. Patent dated April 27, 1855 (No. 952). The inventors describe certain improved tiles, so shaped that a recess in one falls over a projection on the other, the whole being afterwards clamped together by means of metallic wires, &c.

Sanders, F. G. of the Patent Architectural Pottery, Poole, Dorset. "Improvements in brick, pipe, and tile machines." Patent dated May 12, 1855 (No. 1,069). *Claims.*—1. The construction of brick, pipe, and tile machines, wherein screws are fitted at either end, for the purpose of forcing the plastic materials in opposite directions. 2. The application of knives, either to double or single shafts, for mixing and forcing clay through the die or lateral openings, or for pugging.

The following is from a list of provisional specifications not proceeded with:—

Wright, L. W. of Birmingham, engineer. "Certain improvements in locks." Application dated May 1, 1855 (No. 978). This invention consisted in constructing a form of lock in which the key had to pass one or a series of slotted plates or wards, at every half-turn. A screw-pin, being an exact counterpart of the screw-key, is fitted to the lock-plate, and receives the key, on the lower end of which may be a bit to catch one or more tumblers. A cam piece is attached to the stem of the screw-pin at its lower end, and under the bolt, and when in a state of rest, is in a line almost parallel with and against a portion of the bolt. The tumblers are applied to side of bolt, working by means of a spring in a slot or notch, which tumblers are raised by the key in locking only, and not in unlocking: the screw-key both in locking and unlocking turns in same direction.

Notices of Books.

Treatise on Conic Sections. By the Rev. G. SALMON, M.A. Third edition. Longman and Co. 1855.

THERE is scarcely any scientific subject upon which so many treatises have been written as the conic sections. Since the time of Archimedes they have formed subjects for investigation to every eminent mathematician, each finding some new beauty or peculiarity in these remarkable curves. But it is from the time of Des Cartes (A.D. 1637) that we date the most important development of the properties of conic sections: it was he who by first bringing the powerful aid of algebra to bear upon geometry, laid the foundation of our extended knowledge and application of these curves. The method which he introduced was the laying down the position of any point on a curve with respect to a fixed point called the origin. This is done by drawing two straight lines, intersecting at right angles in the origin, and measuring the distance of the point from each line. To take a familiar illustration of this, let us suppose a small object laid on the floor of a room, and we require to know exactly its position with respect to one corner of the room, so as to be able to place it at the same spot again: if we measure its distance from the two walls which meet at the given corner, this will enable us to restore it to its place.

This is the principle introduced by Des Cartes in applying algebra to geometry; and the two measurements above described are called the *co-ordinates* of the point. His method is now universally adopted in all works on the higher branches of mathematics or natural philosophy, and according to it a curve is said to be given when its *equation* is given, *i.e.* the relation which exists between its co-ordinates, which are generally called x and y. In algebra, an equation is said to be of the *first degree* if x or y enter it with no higher powers than the first, and of the *second degree* if x^2 or y^2 enter into it, but no higher powers. Thus, the conic sections are called curves of the *second degree*, since their general equation is,—

$$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0;$$

and this equation stands for ellipse, parabola, hyperbola, or straight line, according to the values given to the co-efficients, A, B, &c. Hence this branch of mathematics is now called "Algebraic Geometry;" but the term belongs to every application of algebra to geometry, which now extends far beyond the limits of the conics.

The work before us is one which we should have great confidence in placing in the hands of students desirous of an intimate acquaintance with the higher mathematics, since it will introduce them to all the most approved modern methods of treating the subject, and also will carry them far beyond what most works of the kind will do; as, for example, the "harmonic properties" of conics, and the interesting theorems connected therewith, of which a full account is given, but which have hitherto been generally avoided or merely glanced at in elementary treatises. There is one point in the arrangement which may cause difficulty to the elementary student, viz. discussing the ellipse and hyperbola together in the same chapter as "central equations," which has the advantage of showing their intimate connection, but is likely to prove very embarrassing to the student, for whom it is necessary to treat the peculiarities of each curve separately. To make this treatise complete, there should be a separate chapter on each of these curves previously to that above mentioned.

The fact of this work having arrived at its third edition in five years, proves that it is one for which there was a want, and that it has filled up the lacuna. The edition before us contains much new matter in the way of examples and applications of the various theorems.

VARIORUM.

"Health and Comfort; their Attainment and Preservation," by George Wyld, M.D. is a little threepenny tract intended for distribution among the working classes, for which purpose it is to be sold (in quantities, and at a reduced rate) at Exeter Hall, by the Society for Improving the Condition of the Working Classes, as well as by the trade publishers, Shaw, of Paternoster-row, and others. In his brief introductory remarks, the author says, "At our hospitals and dispensaries in London there are probably not fewer than 500,000 prescriptions written in a year for ailments, a very large proportion of which might have been avoided by attention to the most common rules of health. There is, however, at our hospitals, no opportunity for explaining fully to the patients these very simple though much neglected rules; and it is with the hope of in some small degree supplying this want that I now publish this little work. We have hundreds of thousands of religious tracts annually distributed among the working classes; but though sin, disease, and misery, ever go hand in hand, we have few tracts bearing upon the moral and physical condition of the people. I earnestly desire to supply in some degree this crying want." The limits being very circumscribed in a tract for extensive distribution, likely to be at all saleable, the various subjects treated of are unavoidably handled in a curt and axiomatic way, but with those multitudes amongst the working classes who require such tracts, this is precisely the way best adapted to give force and effect to sanitary and other rules of moral and physical conduct. Such tracts are much needed, and might very advantageously be combined with, and distributed amongst, religious tracts themselves, harmonizing as they mutually do in the promotion of the moral and general elevation of the lower orders.

Miscellanea.

THE PAVILION AT BRIGHTON.—A paper on this once "Royal property" has been printed by order of the Pavilion Committee,—namely, the report of a sub-committee, "for appropriation of the Pavilion Property." It is dated 14th January, 1856, and occupies nine closely-printed pages of foolscap. From an abstract of it in the *Brighton Herald*, it appears that the scheme is a colossal one, which will require a large sum to carry it out; but the purpose is to make the Pavilion a paying concern, while devoting it to public purposes, and to recreation and amusement. The palace proper is proposed to be divided and mainly rented for public or social purposes, weekly or nightly; the north property to be converted into a winter garden (to occupy the great dome), a museum, picture gallery, public library, and riding-house; and the grounds and precincts to be arranged and altered in detail, as suggested.

THE WESTMINSTER IMPROVEMENT COMMISSION.—Some extraordinary revelations have come forth with respect to this corporate body, which was created by Act of Parliament ten years ago for the purpose of building Victoria-street, Westminster. The body had almost the character of a Government corporation, for it was endowed with an unrestricted power of borrowing money, coupled with grants out of the London Bridge Approaches Fund, and the improved rates of the parishes in Westminster. The accounts were to be examined by the Commissioners of Woods and Forests. The corporation at length became involved: bonds were issued to builders, who advertised them for sale upon the lowest terms; and in January, 1855, the commission became totally insolvent. A meeting of the bondholders was called: a committee of investigation was appointed; and a petition has been presented to the House of Lords, and a bill of complaint filed in Chancery. It is asserted that the commissioners have incurred a deficiency of 100,082*l.* They have since, as far as can be ascertained, put forth bonds to the amount of 1,030,570*l.* of which they say 89,700*l.* have been cancelled, leaving 977,050*l.* as the amount in circulation on the 31st of December, 1854, when they stopped payment. Besides the means thus raised, the commissioners are alleged to have mortgaged the freehold property of the undertaking for 271,500*l.* The present value is only 167,200*l.*; but it is thought that about 140,000*l.* worth of the mortgages would be ignored by the Court of Equity, and it is calculated that the value of the street will be greater when it is completed. The commissioners are also accused of issuing bonds to a large amount without proper security; of issuing 58,000*l.* worth within a few days of their insolvency; of making an undue charge for interest; and of executing preferential mortgages almost at the very moment of the stoppage. They are now selling bonds at the rate of about eight per cent.—a proceeding which will ruin many of the present holders; but it does not seem that the commissioners are amenable to any punishment.—*Leader.*

*** Very long ago we drew attention to the peculiar proceedings of these commissioners.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.—The first general meeting of this society was held on Monday evening last, under the presidency of Lord Londesborough, in the appropriate locality, old Crosby-hall, Bishopsgate-street. The papers read were:—"A general Introduction to the Antiquities of London and Middlesex, and to the Objects of the Society," by the Rev. T. Hugo; "Notes on Roman London," by Mr. Charles Roach Smith, in which the writer suggested many new features of interest; among the most important was the conjecture that a Roman amphitheatre had existed on the site of Seacoal-lane, Farringdon-street; "Facts and Documents connected with the Church of St. Helen's, Bishopsgate," by Mr. Thomas Lott; "The History and Architectural Remains of Crosby-hall," by the Rev. Thomas Hugo; and on a "Monumental Brass in Enfield Church," by the Rev. C. Boutell.

SHIPBUILDERS' STRIKES.—The dockyard shipwrights at Portsmouth have struck work for an increased rate of pay. The Admiral Superintendent was to communicate with the Admiralty on the subject. The cause of dissatisfaction is the amount of money they are enabled to earn—6s. a day on the average, working at task-work two or three hours overtime daily. This they contrast with the 7s., 8s. or more, earning daily by men in the private yards. On the other hand, it is urged that the engagement in the dockyard is a permanent one, while the men in private yards are liable to be suddenly thrown out of work. The superannuation enjoyed by the shipwrights in the royal yards is also urged as another advantage enjoyed by them. The Dumbarton shipbuilders' hands are still on strike, and there is little prospect of a good understanding being re-established between the masters and men. Many of the latter are leaving the town, and a large number of boilermakers, brought from Liverpool, refused to work so soon as they arrived and understood that they were wanted to replace others on strike. They therefore returned in a body to Liverpool, their passage being paid by the unionists. On Saturday before last fifty-one men and boys employed on engines in one yard had to be paid off, in consequence of the contract for certain vessels being given up. A further number were to be discharged in another week.

WALKING OFF WITH A WALL.—On Wednesday, the River (Tyne) Commissioners resolved to put in force their Act of Parliament against Thomas Thackeray, a wherryman, charged with having carried off a portion of the river wall opposite the Muck House; and it was stated that an iron manufacturer, in want of chalk, had swept away some 20 yards of wall, his excuse being, that owing to the detention of vessels, he was in such a predicament, that he must either take the chalk, or his furnaces must blow up! From the temper evinced by the commissioners, we venture to say that any future offender who may be caught will "go *Ad Muram*" with a vengeance!—*Gateshead Observer.*

DESTRUCTION OF A CHURCH BY FIRE.—St. Fagan's Church, Aberdale, has been entirely destroyed by fire, according to a Carmarthen paper. It was erected by the Hon. Mr. Clive, the owner of considerable estates in the neighbourhood, and was only opened in 1854. It afforded accommodation for about 700 persons. The "church flue" of course was the source of the mischief. It appears that a woman engaged in cleaning the church had made a fire in the stove, for the purpose of heating some water. She used for the fire a quantity of holly, with which the church had been decorated at Christmas. It is supposed that this fuel being very dry sent a flame through the piping beneath the floor, thence through the flue, which was cut off short at the roof, probably because such an appendage was considered unsightly. This roof was composed of an inch deal in the interior; there was a layer of felt between the wood and the slates. This felt probably became first ignited. The amount of damage done is estimated at upwards of 2,000*l.* The edifice, it seems, is not insured. The entire wood-work is consumed, the walls remain standing; but it is expected they will have to be rebuilt: the bell fell to the ground, but fortunately is uninjured.

EDUCATIONAL SOIREE AT GORTON LOCOMOTIVE WORKS.—The opening of a literary and educational institution, in connection with the extensive locomotive works of the Manchester, Sheffield, and Lincolnshire Railway Company, at Gorton, was celebrated by a *soirée* at that place, on Saturday evening before last. A large building, ordinarily devoted to the manufacture of waggon-sheets, was for this occasion transformed into a gaily-decorated hall. A very large number of the workmen employed by the company were present, with their wives and families, the latter being represented by individuals of all ages, infants in arms not excepted. Altogether about 700 persons were assembled. Mr. Edward Watkin, the general manager, presided.

State of the Roads at Kennington. — Will you kindly oblige me, in common with the inhabitants generally of the locality, by calling public attention to the disgraceful state of the footpaths of the Kennington and Clapham roads. Commencing this side of Kennington-park, the footways remain unpaved, notwithstanding that the majority of the houses have stood nearly half a century. The consequence is, that after a shower of rain, the footpaths become ancle deep in mud. Why should this be? Why should all the small bye-streets be paved as soon as the houses are erected, whilst the main roads, having of course the greater traffic (and, therefore, of course the more requiring paving), are neglected. The authorities are sharp enough after the paving rates, and it would be interesting to know what becomes of the large amount they must receive. The revenue derived from Kennington-gate, too, must be a long way from a trifling sum. Is it not, sir, a disgrace to the nineteenth century, that so little attention is given to cleanliness in the streets of London, and its suburbs?—J. J.

Oxford Architectural Society.—A course of Elementary Lectures on Architecture is being delivered at the Society's-room, Holywell, during the present term, in the following order: — January 30, Hon. H. C. Forbes, M.A. Oriel College; February 7, Rev. E. Miller, M.A. New College; February 13, Mr. Parker; February 20, Mr. James Parker; February 27, Rev. H. B. Walton, Merton College; March 5, Mr. Hingston, B.A. Exeter College.

New English Church at Cannes (South of France).—This agreeable winter resort, on the shores of the Mediterranean, now enjoys the advantage of a Church of England. The new edifice lately erected at Cannes, is in the Gothic style of architecture, from a design by Mr. Thomas Smith, of Hertford. Through Lord Brougham, and our Ambassador in Paris, permission has been accorded by the French Government, to open and use it for service in the English language, in accordance with the forms of the Established Church of England. The dedication took place on 27th December last, and was conducted by Bishop Spencer, late of Madras.

Plymouth School of Art.—This institution was opened on Monday before last, and, according to the local *Times*, bids fair to be a successful undertaking. The mechanics of Plymouth, it appears, have availed themselves of this opportunity for improvement. Mr. Offord, the teacher, delivered a suitable address at the opening, and during the evening fifty-one tickets of admission were taken up, and a special class of twenty members formed. A ladies' and a gentlemen's class have also been commenced.

"Halting Places."—It is presumed this matter will speedily come before the public in a practical shape. In many prominent and desirable places, the difficulty may be got over by excavating a space of about 8 feet square and 6 deep, partially covered over, with step on two sides, keeping clear of the gas and water pipes.—L.

Metropolitan Board of Works.—At a meeting of this board, held on the 25th ult. the election of engineer was proceeded with, when Mr. Bazalgette, Mr. Rawlinson, and Mr. Henry were called upon to urge their respective claims to the office, after which Mr. Bazalgette was elected. We have received several letters on the subject, mostly personal. Afterwards the board proceeded to the choice of an accountant, when Mr. Hatton was elected by a large majority. As to the Superintending Architect, our advertising columns will show the required qualifications and duties. The salary is not large enough.

New Digging Machine. — The Rev. H. G. Bailey, of Swindon, has patented a digging machine, to be worked either by steam or horse power. A row of spades or forks, working to a much greater depth than by manual labour, produces, according to the *Staffordshire Advertiser*, a perfect inversion of the soil in a manner hitherto attained only by hand.

Coating Iron.—Messrs. Morewood and Rogers have invented a method of coating sheets of wrought-iron. The sheets are to be first cleansed by dilute acid in the ordinary manner, then covered over with some one or more of the following substances in a solved or melted state, viz., turpentine, resins, lac, gums, oil, grease, gelatinous or bituminous matter. Sheets so prepared will be ready to be soldered without being first coated with tin.——In the electro-coating of iron, Mr. F. Puls has patented the regulation or modulating of the intensity or quantity of the electric current from the battery proportionately to the surfaces of the iron to be coated, thus causing the zinc to be deposited upon the iron in the smallest possible particles or atoms, thereby securing a perfect adhesion of the zinc to the iron.—2. The employment of sulphate or hydrochlorate of zinc, or double or treble salts of same, with potash, soda, and ammonia, for the purpose described.—3. The rinsing of the exhausted fluid from the bath in the battery, and that from the battery in the bath.

West's Safety Coal-hole Plate.—Having reference to the numerous accidents caused by the slipperiness of the ordinary iron coal-plates, a substitute has been devised by Mr. West. It consists of a flat thin iron cup, so to speak, 12 inches in diameter, the rim about 1½ inch deep, and 1-10th of an inch thick. Into this a piece of stone corresponding with that of the pavement is cemented. A simple iron rim, with a lip at the bottom to hold a piece of hard, stone or slate, might even answer the purpose.

Proposed College of Mining Engineers, at Newcastle-upon-Tyne. — For some time the members of the Mining Institute of this town have had in contemplation the establishment of a Mining College, upon a scale commensurate with its importance. Recently the committee of management have issued prospectuses concerning the college, in which they solicit subscriptions, and the Duke of Northumberland has promised, that should the committee raise 15,000*l.* he will contribute 5,000*l.* towards that sum; and should they raise 30,000*l.* he will subscribe 10,000*l.* It is also expected that the Marchioness of Londonderry, Earl of Durham, Lord Ravensworth, and others interested in the coal produce of the district generally, will contribute largely to the project. The manufacturing interests are to be combined with the mining in the projected institution.

Conversazione of Norwich School of Art.—During the last year the number of students in this school has steadily increased, and to the extent of one-third more than in former years in the special and intermediate classes. The scholarships given by Sir S. Bignold, M.P., E. Warner, esq. M.P., and J. H. Gurney, esq. M.P., according to the *Norfolk Chronicle*, have elicited a remarkable degree of emulation among the students. These scholarships are privileges which only this and one or two other schools in the country possess. On Thursday evening in last week, the rooms in St. Andrew's-street were filled by a fashionable assembly. The committee of the school held a *conversazione*, with a view of promoting a taste for art among the citizens. This meeting was not intended for business but for pleasure, and the intention was fully realised. The class-rooms and gallery were filled with works of art, numbers of photographs, and engravings, sent by the Board of Trade Department of Science and Art, besides a selection of designs for manufactured articles, and illustrated works. For about an hour the company inspected the works of art in the different rooms, and then, by request, reassembled in the large room, to hear several addresses delivered.

Gas Stoves.—Gas stoves require to be securely fixed. A short time since I was called upon to assess a fire loss which occurred in the manager's room of a gas-works, and was caused by the gas-stove used therein, and but for a timely discovery would have occasioned a very serious loss. The stove was supplied with gas by means of a pewter pipe, and there being no provision for fixing the stove to the floor, the smallest motion given to the stove would cause a rupture of the supply pipe,—and to this cause I attributed the accident. The stove was manufactured by an extensive manufacturer of the article, who has made no provision for fixing the stoves, although when I called at the establishment and pointed out the apparent cause of the accident, they admitted the necessity of it. There is some danger too, I apprehend in the unsoldering of the joints.—A. B.

Organs: the Effect of Vibration. — As you have lately given space in the *Builder*, to some interesting remarks on the king of musical instruments, the organ, perhaps I may be allowed, in continuation of the subject, to ask for information, through the medium of your valuable journal, on a question of some importance to architects. Supposing the actual weight of an organ to be 10 or 12 tons, what extra strength of floor, or other supporting power, should be provided to guard against the effect of vibration? An experiment (not very carefully made, it is true), gave me a curious and apparently contradictory result with regard to stopped and open wood pipes. A C C C (stopped) Bourdon pipe, 8 feet long, gave more vibration to a piece of wood, 5 feet in length, fixed at one end, in the ratio of 3 to 2, than did an open pipe 16 feet long, giving the same note. Wood open pipes also seem to give more vibration to surrounding objects than metal pipes of the same dimensions. Is this correct?—T. W. H.

"New Black Paint."—Mr. M. Staite, says a contemporary, crushes carbon by means of hammers and rollers, and grinds it by means of stones, and then takes the dust and passes it through sieves (of about 3,000 holes to an inch), or subjects it to successive washings in large tubs. When a sufficiently fine dust or sediment is procured, he mixes it with linseed oil, in the proportion of about six gallons to a ton, and re-grinds it to a fine soluble paste." Such a paint may do very well for iron or other incombustible surfaces, but its liability to give rise to spontaneous combustion suggests the necessity of care in its use.

Building Operations in Liverpool. — The annual report of Mr. Rishton, the building surveyor, was read before the Health Committee of the Corporation recently. The principal facts contained in it are as follow:—Dwelling-houses and warehouses erected, or in course of erection, within the municipal borough during 1855,—under 12*l.* per annum, 63; from 12*l.* to 25*l.* 1,144; from 25*l.* to 35*l.* 99; from 35*l.* upwards, 49: total, 1,355. Warehouses, 9. Comparative statement of the number of dwelling-houses erected since 1838,—1838, 1,052; 1839, 997; 1840, 1,576; 1841, 1,761; 1842, 2,027; 1843, 1,390; 1844, 2,450; 1845, 3,728; 1846, 3,460; 1847, 1,220; 1848, 656; 1849, 446; 1850, 420; 1851, 837; 1852, 1,136; 1853, 924; 1854, 829; 1855, 1355: total, 26,264. Buildings (not dwelling-houses) erected, alterations made, and dangerous dwellings taken down or secured, during 1855,—buildings: such as stables, smithies, &c. 77; such as manufactories, offices, &c. 73. Alterations and additions: of extensive character, 60; of inferior character, 303. Dangerous buildings taken down or secured, 97. The dwelling-house erections last year have been in excess of those in 1854. In 1854 there were only 829 dwelling-houses erected, whereas, last year, as will be seen, there have been 1,355 erected. Of this number 63 will let at about 10*l.* or 12*l.* per annum each; 1,000 at about 15*l.* or 16*l.*; the remainder at much higher rents.

A Crooked Railroad.— The *Potsville Journal* says that one dark night last week, an engineer of a lengthy freight train on the Catawissa Railroad, to his horror, perceived a light rapidly approaching, as he thought, upon the track. He sounded the alarm, and the brakes were at once applied, when he discovered that it was the signal upon the rear car of his own train, which, from the great curvature of the road, shone full upon him! It is related of a railroad somewhere in Virginia, that the engineers give themselves no uneasiness when they run off the track, confident that they will come upon it again before they go a dozen rods. Perhaps this is the same road.

Monument to Alfieri.—The committee, formed many years ago at Asti, for the purpose of gathering subscriptions towards a monument to Alfieri, having now collected a sufficient sum, have issued a notification to all those sculptors who had sent models at different periods, informing them that they alone will be admitted to the competition for the erection of the monument, on condition of their sending to the committee, within three months, a model of the height of 1½ metre, the names of the competitors to be concealed in the usual manner. The size of the statue of Alfieri, when executed, is to be 4.30 metres.—*Galignani.*

Arches under Public Ways.—It may not be amiss to remind builders and others interested, that in putting in these works without the proper notice, they incur a penalty of 20*l.* with a probability of the works being abated. It is quite time they were made the subject of regulation as to the thickness of their crowns, &c. &c.: see sec. 25 of the Metropolitan Building Act. As regards the constant removal of the crowns of ovens, as named in your paper, this is rendered necessary only by their faulty construction.—Nemo.

TENDERS

For a shop warehouse for Messrs. Hanyman and White. Mr. Henry Currey, architect. The quantities taken out by Mr. Richard Roberts:—

Haward and Nixon	£3,647	0	0
Lee and Son	3,640	0	0
Lucas	3,495	0	0
Rider	3,370	0	0
Willson	3,295	0	0
Higgs	3,131	0	0
Ashby and Horner	3,090	0	0
Downs	2,833	0	0

For schools and residence to be erected at Horsington, near Wincanton. Mr. Henry Hall, architect:—

Davis	£1,050	0	0
Green	963	0	0
Wellspring	910	0	0
Down	860	0	0
Harris	858	10	0

TO CORRESPONDENTS.

"W. A."—"J. W."—"J. L."—"W. W."—"C. L. N."—"J. M." "J. E."—"J. B."—"J. L."—"H. E. K."—"E. C. L."—"H. S." (if neither story be more than 10 feet high, the wall may be wholly of 9 in. work).—"C. H. W."—"Sir A. A."—"T. S. W."—"J. S."—"L." (special circumstances would of course regulate charges: the recognised commission is 5 per cent.)—"T. J. P."—"W. P. G."—"E. H."—"Mr. B."—"H. W."—"C. and A. G."—"Kent Mutual."—"J. B. G."—"J. F."—"H. H."—"C. W."—"E. C."—"G. H."—"E. W. L."—"J. A. M."—"St. James's Park" (writer's name not given).—"W. G. E."—"Wandering Willie."—"Subscriber to the Art-Union."—"B. W. J."—"Fair-play."—"C. V."—"C. H. S."—"Anglo-Catholicus."—"E. W."—"H. D."—"M. E. H."—"J. G. B."—"T. W."—"Barkston."—"Old Subscriber."

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

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